LIGHTWAVIN'

The Magazine For LightWave Animators

NO. 2 MARCH/APRIL 1997
$5.95 / $11.95 with CD-ROM

COMPOSITING
WITH LIGHT MASKS

CHARACTER ANIMATION
LIP SYNC

INTERVIEW:
FOUNDATION IMAGING

PRODUCT REVIEWS:
GAFFER & 5 LIGHTWAVE BOOKS

LightWave [illegible] trademark of NewTek, Inc.

LIGHT

LIGHTSPEED

2763 West Ave L Suite 172
Lancaster, CA 93536

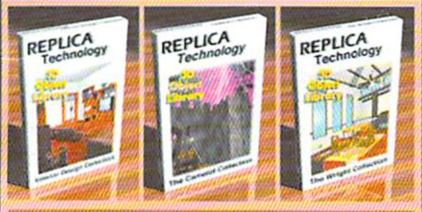
US Orders	1-800-764-8696
Other Orders	1-805-726-3545
Fax Orders	1-805-726-3544

Order from our web site at http://www.webcom.com/lghtspd

PUPPET MASTER

Character Animation has never been easier

Amiga $159.00
Intel $309.00
Alpha $359.00



The Interior Design Collection
The Camalot Collection
The Wright Collection
$169.00 each

SPARKS

V 1.1 Intel	$199.00
V 2.177 Amiga	$159.00
DEC Alpha	$199.00

WAVE FILTER

Amiga
Intel
Alpha
$172.00

LightWave 3D 5.0

Amiga	$1195.00
Intel	$1195.00
Mac	$1195.00
Alpha	$1295.00

VertiLectric

Intel
$95.00

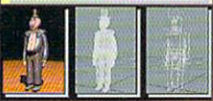
SOUND FORGE 4.0

DIGITAL SOUND EDITING FOR WINDOWS

Intel & DEC Alpha
$399.00

CON-MOTION

Intel
$395.00



WinImages

Intel & DEC Alpha
Release 4
$439.00

IMPACT!

Intel $319.00
Alpha $419.00

LOCK & KEY

Amiga/Intel $189.00
Alpha $289.00

PARTICLE STORM

Intel $259.00
Alpha $359.00

ShaderMan

RenderMan shaders for LightWave

Intel $159.00
Alpha $199.00

HOLLYWOOD FX

Intel	$429.00
Alpha	$729.00

Video Action NT

Video Editing and Effects Software

Intel or Alpha
$929.00

OXYGEN

Pure Creative Fuel For 3D Acceleration

Oxygen 3D graphics Accelerator 102
8 meg
single processor
$1445.00

Accelerator 202
16 meg
dual processor
$2695.00

Pyromania

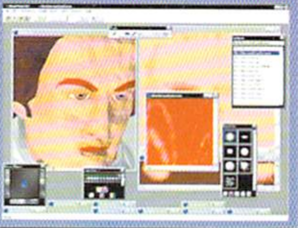
Volume 1
Volume 2
$135.00 each

MESHPAINT 3D

WIN 95/NT
$399.00

DEC Alpha
$539.00

MeshPaint lets you paint directly onto 3-D objects in real time, eliminating the old wrapping PROBLEMS that were like trying to gift wrap a bowling ball. And with all of the features to make your life easier, you'll be a MeshPaint GROUPIE in a matter of minutes.



ELASTIC REALITY

DEC Alpha
$559.00

PATH↔FINDER

Amiga
Intel
Alpha
$179.00

WORLD CONSTRUCTION SET V 2.0

Available for

Amiga	$399.00
Intel	$599.00
Alpha	$699.00

DIGITAL

PROCESSING SYSTEMS INC.

PVR FX 2500 Accelerator	$899.00
PVR Perception Video Recorder 2500	$1649.00
PVR Video Perception Capture AD2500 Card	$899.00
PVR Together Includes cables	$2499.00
PVR A4V Audio Card	$1299.00

SPEED

LIGHTSPEED
2763 West Ave L Suite 172
Lancaster, CA 93536

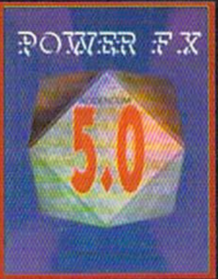
US Orders 1-800-764-8696
Other Orders 1-805-726-3545
Fax Orders 1-805-726-3544

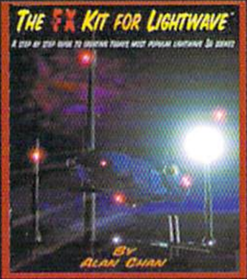
Order from our web site at http://www.webcom.com/lghtspd

TOKEN
MUSIC PRODUCTION LIBRARY
Royalty free music CD-roms
Volume #1
Volume #2
Volume #3
$25.00
Each

AWESOME BOOKS FROM LIGHTSPEED

POWER FX 5.0	THE FX KIT FOR LIGHTWAVE	PHOTOREAL FX
$24.95	$34.95	$44.95




THE FX KIT FOR LIGHTWAVE
BY ALAN CHAN

PHOTOREAL FX

DESKTOP IMAGES
LightWave 3D QuickStart
LightWave 3D Advanced Features
LightWave 3D Mastering Modeler

VIDEOS ONLY
47.95 each

Ron Thornton
Spacecraft Design
Spacecraft Surfacing
Digital Cinematography
Cinematic Visual Effects

John Gross
Lightwave Quickstart
Mastering Modeler
Surfacing Techniques
Advanced Features

Plaid Companion

Plaid Companion CD
$24.00

DIGITAL MUSEUM

Digital Museum CD
$129.00

UNIVERSAL 3DCD

Universal 3DCD
$129.00

WaveMaker 2.0

AMIGA/$185.00

SCENE MACHINE

Intel
$185.00

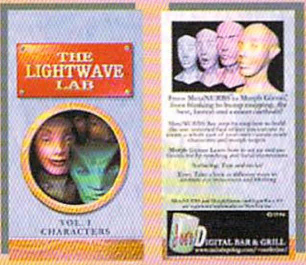
MOVIE MODELS
Volume 1
AVIATION
CD-ROM
$169.00

LIGHT-ROM GOLD

LIGHTROM 4
LIGHTROM GOLD
$44.00 each

Volcano Music CD
$29.95

THE LIGHTWAVE LAB VIDEO


THE LIGHTWAVE LAB
VOL. 1
CHARACTERS
DIGITAL BAR & GRILL

VOL. 1 -CHARACTERS-
$39.95

TUTOR VISION
3-D CD
Interactive Tutorials for LightWave Animators

Tutor Vision 3-D CD
Intel or Alpha
$69.95

FABULOUS VIDEOS ONLY AVAILABLE FROM LIGHTSPEED

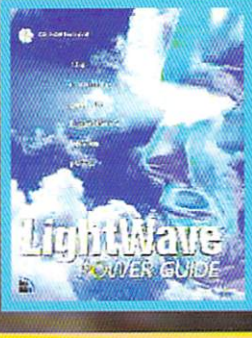
1996
LIGHTSPEED
ANIMATION CONTEST
Compilation Video

1996 LIGHTSPEED Animation Contest Video
$24.95
PAL $29.95

Starting Your Own Animation Business Video
$59.95
PAL $64.95

LIGHTSPEED
Tutorials
Animations
Tips
Tricks

LIGHTSPEED Video Magazines
Issues 1-4 $9.95
Issues 5-6 $19.95
PAL add $5.00


LightWave
POWER GUIDE

LIGHTWAVE POWER GUIDE
Book w/CD
$44.95

LightWave 3D 5
Character Animation
f/x

Lightwave 3D V 5
Character animation F/X
Book w/CD
$47.95

MORE LIGHTSPEED PRODUCTS

BML For Modeler Scripting Plugin	$199.95
BML For Modeler Script Compiler	$199.95
BML For modeler (Both plugin & Compiler)	$349.95
Discovering The Internet (video)	$29.95 / PAL $34.95
Communicating On The Internet (video)	$29.95 / PAL $34.95
Video Publishing On The WWW (video)	$29.95 / PAL $34.95
Digital Fantasies(animation tape)	$19.95 / PAL $24.95
Fiber Factory	Amiga $89.00 Intel $124.00 Alpha $189.00
Project Modeler I (Video)	$39.95 / PAL $44.95
Project Modeler II(video)	$39.95 / PAL $44.95
PVR Hi Density SCSI 2 Adapter cable	$35.00
PVR External 50 Pin SCSI Adapter connector	$20.00
ShaderMan	Intel $159.00 Alpha $199.00
Surface Effectors	Amiga / Intel / Alpha $99.00
WaveFilter Net Plus	Amiga $172.00 Intel / Alpha $ 449.00
WaveNet Pro	Intel $349.00

EDITORIAL

As Publishing Director of LightWavin' magazine, I knew a void was created when the only two sources of printed LightWave material ended. This void had to be filled and we were the people that could pull it off. Our first point of order was to let LightWave users know of our existence. Without news stand sales, how would we build up a subscriber list? Luckily for us, we already had a large base of loyal LightWave customers and with the help of several other LightWave third party developers, we were able to put together a formidable mailing list of over 10,000 LightWave users. We sent out our premier issue with our fingers crossed hoping that the LightWave community would receive it well. As it turned out, the response was almost immediate... and well received. The phone lines literally rang off the hook. It didn't hurt that Video Toaster User and LightWave Pro were canceled and people were looking for a quick replacement. The calls poured in, e-mail flooded the LightWavin mail boxes and we received hundreds of letters, not to mention all the subscriptions that came in. Our initial supply of the January/February issue (#1) quickly ran out of stock, forcing us to start all new subscriptions with issue #2. We sat down with every piece of e-mail and letter sent to us and listened to what you wanted to see in future issues. In fact, we have started implementing many of these things in this very issue. The most common request was to have us include more tutorials. Coming in a close second was the request to have an image gallery to showcase the work of other LightWave artists. And third but not least was the request to review some LightWave products. Did we listen? You bet!

Welcome to the second, and what I believe to be a much better and more refined issue of LightWavin' Magazine. This issue covers all the suggestions listed above and more by introducing several new columns. On-Topic , headed by David Warner, moderator of the super popular LightWave Mailing List, will answer readers LightWave questions asked on the Internet. Former Model Shop author Kyle Thatch, introduces us to Tectonics, your source for information on using Modeler. LightWave 5 Character Animation F/X book author Doug Kelly, takes us into his Character Shop. It's our answer to the many requests to cover character animation on a regular basis. Tom Rennen, Producer of the very popular 'Starting your own animation business' video comes to us with a new column entitled, Getting down to business, which will tackle topics related to making money with LightWave 3D. Company Profile is another new column that lets readers see who is behind the great companies that make all these fantastic products for LightWave users. And last but not least, our Image Gallery allows readers like yourself to showcase some of your best work. Throw in a couple reviews and a feature article on one of the most prominent CG houses in the United States and we've got a pretty well rounded issue. For future issues, we've also recruited writers from some of the top CG firms around including Foundation Imaging, Digital Domain & more! With the support of our loyal readers, you can expect us to make LightWavin' the magazine you want it to be.

A lot has happened since we shipped the premier issue. NewTek began shipping LightWave 5.0 for the Power Mac & Amiga platforms. Several new LightWave plug-ins and a new book have hit store shelves. Many companies made special announcements and are expanding while others unfortunately didn't make it through the year. We'll cover more of this in our 'From The Front' news column.

While we're at it, don't forget about the fantastic CD-ROM available with this issue. We've packed a lot of cool stuff onto this months CD-ROM including a bunch of plug-ins. Due to the huge request from people wanting to purchase the CD-ROM by itself, we've made them available for $10 each plus S/H. Obviously you get a much better deal if you subscribe to both the magazine and CD-ROM, but it's available never the less.

If it's the best reviews, the greatest tutorials and pure LightWave content you want, LightWavin' Magazine is your only choice! See you in May.

Manuel Coats
Publishing Director

Contents

FROM THE FRONT 6
News from the front line

REVIEW: GAFFER 10
Take a first look at this powerful new shader plugin from Worley Laboratories.

COMPANY PROFILE 14
This month we take a look at Dynamic Realities and how they have had an impact on the LightWave market.

TECTONICS 16
Modeling a screwdriver has never been easier.

POLYGON REDUCTION PART TWO 20
Getting your polygon count lower and lower on your objects. Part two in the series.

GETTING DOWN TO BUSINESS 24
What to charge for your 3D animation.

REVIEW: FIVE LIGHTWAVE BOOKS 26
An in depth look at the five LightWave books currently on the market.

CHARACTER SHOP 30
Lip-Sync made easy. A new column focusing on character animation.

INTERVIEW: FOUNDATION IMAGING 38
An interview with some key people from Foundation Imaging.

LIGHT MASK 41
Using Open-GL to create shadows for compositing work.

IMAGE GALLERY 44
LightWave artists on the Internet show off their best stuff.

ON-TOPIC 45
Your questions are answered in our forum.

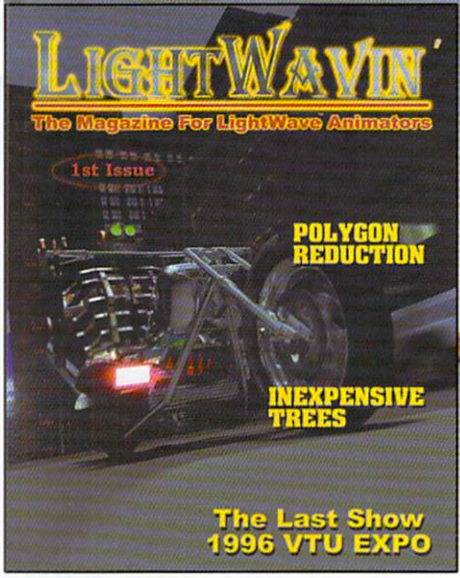
Publishing Director: Manuel Coats
Technical Editor: David Warner
Assistant Editor: Bill Fredette
Contributing Writers: Jason Booth, Emile Smith, Tom Rennen, Steve Bowie, Kyle Thatch, David Warner, Walter Turberville, Doug Kelly

This months cover was created by Jeff Scheetz, an animator at Foundation Imaging (see story). In addition to his duties as spokes-alien for Mercantile Bank in Lawrence, Kansas, Steve is the star of a short film Jeff would work on if he had spare time. The head was made using metaform, long before nurbs. The entire scene has about 55,000 polygons and was rendered in 2 passes so the background could be blurred a bit. All reflections are a spherical reflection map using an earlier version of this same picture. Jeff can be contacted at jeff@foundation-i.com.

LightWavin' is published 6 times annually by LightWavin' Multimedia - 2763 West Avenue L Suite 172 - Lancaster - Ca - 93536 - USA. To subscribe, call 805-726-3546 or write to the address above. If you are interested in writing for LightWavin' Magazine or submitting images, press releases or any other LightWave related content, please send e-mail to lightwavin@qnet.com. For advertising information ONLY, please call 805-945-9870.

SUBSCRIBE!

Start your LightWavin' Magazine subscription today and start receiving the best tutorials, product reviews & news from the only magazine dedicated 100% to LightWave 3D !


LightWavin'
The Magazine For LightWave Animators
1st Issue
POLYGON REDUCTION
INEXPENSIVE TREES
The Last Show 1996 VTU EXPO

One Year Subscription (6 Issues) with LightWavin' CD-ROM: $48

One Year Subscription (6 Issues) WITHOUT CD-ROM $24

Two Year Subscription (12 Issues) with LightWavin' CD-ROM: $84

Two Year Subscription (12 Issues) WITHOUT CD-ROM $42

To order your yearly subscription to LightWavin' Magazine, call: (US ONLY) 800-764-8696 or (ALL ORDERS) 805-726-3546 or send check/money order in US $ to:

LightWavin' Magazine
2763 West Avenue L Suite 172
Lancaster, CA. 93536

You can also place your order on-line at http://www.webcom.com/lghtspd

Canada/Mexico Please add $12 for Additional postage per year. All other countries add $30 for additional postage per year.

THIS MONTH'S LIGHTWAVIN' CD-ROM CONTENTS

PLUGINS

Particle Storm Demo Version - Intel/DEC Alpha

Stripper Demo Version - Intel

QV Full Version - Intel/DEC Alpha

Area Volume Full Version - Amiga/Intel/DEC Alpha

Lwwf2avi Full Version - Intel/DecAlpha

Lwssf2anim Full Version - Amiga

VDEM2.stm Full Version - Amiga/Intel

AVILOAD Demo Version - Intel

Super Quadratic Full Version - Intel

Surface Effectors Demo Version - Intel

Spiral Full Version - Intel/DEC Alpha

* Lightwave 5.0 Patch

PROGRAMS

Magpie track analysis software

Paint Shop Pro 4.0

Plus Megabytes and Megabytes of animations and other cool stuff !!!

Contents of CD-ROM for January/February issue:

New AVI Saver - PCX Loader/Saver - New LW Panels plugin for Amiga - New Parent Bone Plugin - Depth of field plugin - New image format loader plugins, including :PHOTOSHOP PSD, JPEG, SGI, YUV, TIFF, RLA, SUN & BMP. Plus Animations, Images & More!

You can now order each CD-ROM separately for $10 each + $4 S/H.
To order, call 800-764-8696 (US Only) or 805-726-3546.
You can also send check or money order to:
LightWavin Magazine - 2763 West Ave. L Suite 172 - Lancaster - Ca - 93536

FROM THE FRONT

PowerMac & Amiga LightWave 5.0 ship!

Late January, NewTek announced that PowerMac and Amiga LightWave 5.0 are now shipping in quantity. Price is US$1495. Registered Toaster/Flyer or Amiga LightWave Standalone owners can update to Amiga Lightwave 5.0 for their registered product for US$295. Amiga Cross-Platform Special Continues - Registered owners of the Video Toaster, the Flyer or Amiga Standalone LightWave may still purchase Lightwave 5.0 for the Intel, Dec Alpha and now the PowerMac, for the special price of US$895. Please contact NewTek directly. The current price list is available on www.newtek.com, or from NewTek's customer service department (1-800-228-8000, or email customerservice@newtek.com). Software updates can now be downloaded directly from their Web Page. The Technical Support section of the Web Page now has the section "Software Updates", with direct links to the FTP site, and a short note explaining each file. Simply click on the file you need, in order to download it.

New Model Libraries From 3D/EYE

3D/EYE has released four new separate volumes of TriGallery, a collection of "professional-quality" 3D objects. Each volume contains 1,000 models and sells for $54.95. In addition, the model galleries also ship with a "mini-3D application" that allows users to view and even render 3D objects, along with output capabilities in a variety of formats including DXF, 3DS, OBJ, VRML, BMP, GIF, Photo CD, PCX, TGA and TIFF. The TriGallery volumes can be purchased directly from 3D/EYE at: (800) 946-9533 or http://www.eye.com

The Internet's LightWave Mailing List finds a new home

For those of you who have never heard of the LightWave mailing list, it's a 'message base' of sorts, where over 1,000 LightWave users on the internet read and post messages each day. How many messages you ask? It's not unusual for more than 100 messages to be posted there each day. During the end of February, the LightWave mailing list was down or running very badly. The reason for this downtime was due to it being moved to a new location - It's new home.... NewTek, Inc.. After several days of tweaking and bug hunting, the mailing list is once again operational and can now be found at lightwave@newtek.com. If filling up your mailbox with hundreds of messages each week sounds undesirable, you can opt to subscribe to the digest form which takes all of the daily messages and compacts them into one large message. You can subscribe to the digest form by sending e-mail to Majordomo@newtek.com. In the body of the message, type 'subscribe lightwave-digest'. To subscribe to the non-digest version, do the same thing except use the word 'lightwave' instead of 'lightwave-digest'.

Tomahawk FTP Site Moves On

On January 31st 1997, the best online resource for LightWave users ceased to exist. The FTP site known as tomahawk.grandi.com is now gone...or is it? In a last minute stroke of luck, the owner and system administrator for the Tomahawk FTP site, Keith Christopher, was able to work out a deal that would not only save Tomahawk, but make it better than it ever was before!
The good folks who host the ftp.cdrom.com site have set up a directory for Tomahawk and Keith Christopher will be in charge of administration duties for this area. All the old files have been moved to this new site with loads of room for new uploads and data transfer rates that are faster than ever. You can visit Tomahawk's new home by logging in anonymously to: ftp.cdrom.com/pub/tomahawk.

Holy Cow! - Another LightWave Hollywood Effects Company!

Matt Merkovich, renowned LightWave animator formerly with Area51, has started a new Hollywood visual effects company called "Holy Cow! Visual Effects". Matt is giving LightWave3D further respect with his ground-breaking work on such projects as the upcoming feature "Starship Troopers" and various national TV commercials, including a new Hostess Ding Dong spot, the Budweiser "Drink Responsibly" PSA which aired during the Super Bowl, and a new Gatorade spot that stars Michael Jordan and began airing in late February.

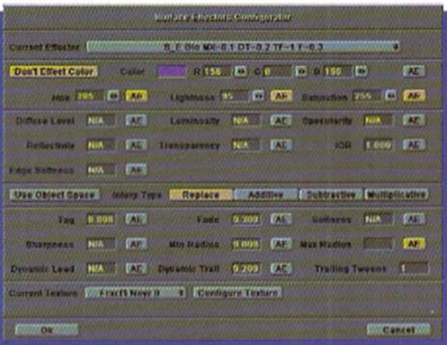
Matt has also begun production on a new "Pyrotechniques 2" video which will cover all aspects of advanced explosions, fire, smoke and energy effects in LightWave, in addition to several other usually overlooked techniques for adding realism to one's animated scenes of destruction. He promises that this video (distributed by Rave) will be well worth the wait although a release date has not been announced.

Surface Effectors 1.1

Prem Subrahmanyam Graphic Design announced the release of Surface Effectors 1.1. As of Jan 1997, the Intel and Alpha versions were in full production with the Amiga version going into Beta. On March 3rd, the PowerMac version has also started shipping. Version 1.1 includes the following new features:

- a full graphical user interface (GUI) that enables the creation and modification of surface effectors in your scene.

- The ability to modify and animate surface color via the Hue-Lightness-Saturation (HLS) color schemes, allowing for the creation of dynamic "colorization" effects (hue shifts, desaturation, oversaturation, brightening/dimming, etc.)



- The ability to apply animateable edge opacity for any surface parameter - as an aside, using edge opacity with reflectivity and specularity simulates the "Fresnel laws of transmission/reflection", allowing for much more realistic rendering of glass, plastic, water, floor tiling, and other non-metallic surfaces.

- The inclusion of a new 4-d (i.e. time-modulated) fractal noise function that does nice simulation of smoke and other vaporous effects.

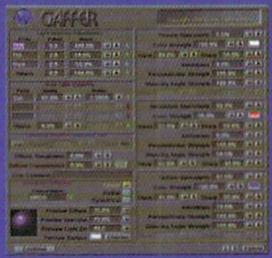
- A new modeler plugin that converts selected points into a scene of Surface Effectors, allowing for the easy creation of banks of effect.

- Tag specific surfaces with a numeric tag, matching Surface Effectors to those surfaces ...however, this is not all...a Surface Effector can dynamically switch tags, allowing for easy animation of such things as in cloud lightning, and chasing lights.

- Leave animated trails with variable falloff behind (or in front of) a Surface Effector, allowing for easy animation of lasers burning text into objects, registered skid marks under car wheels for accident reconstruction, registered tire tread/footprint type effects, etc.
Price for SE/DSFX 1.1 is $99.95 for all supported platforms. Additional information concerning Surface Effectors/DSFX (including a free downloadable demo) can be found at: http://www.noblestar.net/~prems/ppp.html.

Gaffer plugin ships

On Thursday, January 2, 1997 Worley Laboratories began shipping the Gaffer plugin. Gaffer is a new shading plugin that allows for significantly more control over the surface appearance and lighting of objects. For more information, check out this issues review of Gaffer.



Dino's come alive

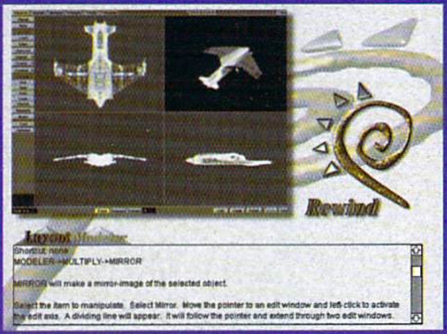
On February 18th, Db-Line Italy announced the re-

FROM THE FRONT

DINOSAURS
Gruppo Iride CD collection vol. I
10 high quality objects for Imagine, Lightwave & 3D Studio Max
ROM
DXF and VRML inside

lease of their new Dinosaurs ROM Vol 1. Ten high quality dinosaur objects for LightWave 3D, Imagine & 3D Studio Max. All dinosaurs come complete with Bones, control for inverse kinematics and "brushes" for bump, color and specular maps. Scenes for walk and run cycles are already included. Also includes animations of each dinosaur rendered in "AVI" and "FLC" formats. Available in several different versions: some for low ram systems and more highly detailed objects for systems with ram to spare. Price is $149. For more information, visit Db-Line at: http://www.dbline.it/mhtm/DinosaursRom-e.htm. Available in the US through Lightspeed.

LightWave Expo New York CD-ROM (LENY CD-ROM)



Shortcut: none
MODELER->MULTIPLY->MIRROR

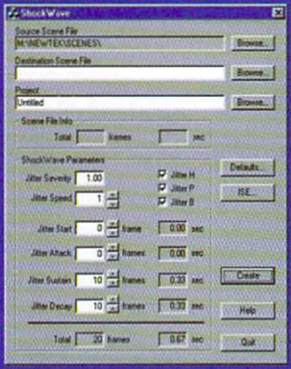
MIRROR will make a mirror-image of the selected object.

Select the item to manipulate. Select Mirror. Move the pointer to an edit window and left-click to activate the edit axis. A dividing line will appear. It will follow the pointer and extend through two edit windows.

The LENY '96 CD ROM (formerly titled Stretching the Canvas) is an interactive video document of 1996's hottest LightWave seminar. Shot live at LightWave Expo New York in August 1996, this 2 CD tutorial set features the venerable LightWave trainer, Lee Stranahan and his able assistant Ken Stranahan. Lee's animated training style and Ken's artistic touch come together to bring you the most comprehensive and entertaining LightWave training yet. Ken reveals the valuable techniques he uses to make LightWave models pop off the screen every week in Sliders. This CD is not a compilation of rehashed Internet material. It features all new tutorials on LW 5.0's hottest features - MetaNURBS, Metaballs, and complex texture mapping with multiple textures to name only a few. These tutorials, from the professionals who brought you Space Above and Beyond, Star Trek Deep Space Nine, Hercules, and more, are not available anywhere else! Additional tutorials from Andy Frerking of Dynamic Realities and PJ Foley of Foundation Imaging cover both Particle Storm and Fiber Factory. Available now from Lightspeed for Intel, DEC Alpha and Power Macintosh. Price is only $79!

Freeware, Shareware... LeaseWare?

ISE, producers of PathFinder and Logo Wizard introduced LeaseWare. What's LeaseWare you ask? It's a way to download software and only pay for what you use! When you download ISE's software from their web site and install it, you'll have full use of it except the SAVE functions will be disabled. This lets you demo the software until you decide whether you wish to purchase it or not. If you do, you simply press the Register Button. The registration will then dial up your Internet server and connect you to ISE's server, registering your copy of the software. At the same time, you can either use the software's initial number of uses or enter the amount of times you'll use the software and only pay for that amount. ISE realizes some people use their software all the time, so there is also a Buy-Out price for unlimited uses. You can find out more by calling ISE or visiting their web site (see below).



Source Scene File: M:\NEWTEK\SCENES\
Destination Scene File:
Project: Untitled

Scene File Info
Total frames sec

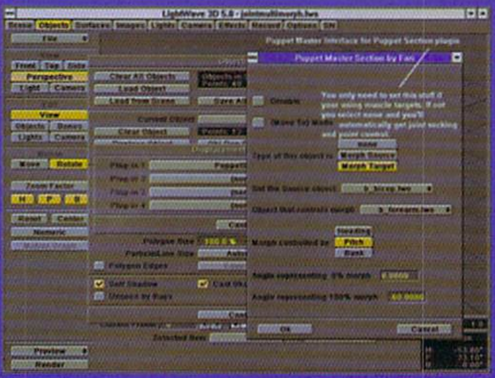
ShockWave Parameters
Jitter Severity 1.00
Jitter Speed 1
☑ Jitter H
☑ Jitter P
☑ Jitter B
Jitter Start 0 frame 0.00 sec
Jitter Attack 0 frames 0.00 sec
Jitter Sustain 10 frames 0.33 sec
Jitter Decay 10 frames 0.33 sec
Total 20 frames 0.67 sec

ISE has also released a new plugin for LightWave called Shock Wave V1.0. If you're looking for a unique LightWave 3D tool to have some fun with, then Shock Wave is your answer. Add it to Lightwave 3D as a generic plugin or use it stand alone. Either way, you'll add some really wild motions to your scenes. Use Shock Wave to simulate the blast felt by the camera or person during a rocket take off. Want to show an earthquake? No problem with Shock Wave. Need an object to go nuts and shake like crazy? Shock Wave will do it for you. For more information or to order, send e-mail to ise@haja.com or call ISE at (906) 475 - 4713.

BML ..... RIP

Virtual Visions, the company that brought us the very cool BML LightWave plugin scripting language, has gone out of business. With the LightWave market being as small as it is right now, all plugin developers (and magazines we might ad) need all the support they can get. Fortunately we hear that the BML scripting language will return. There are rumors floating around that perhaps NewTek is interested in this great product. Could it be an addition to a future LightWave release? We'll bring you the news as soon as it happens.

Puppet Master



Fori Owurowa, the incredible programmer at NewTek who brought us all MetaNURBS, has released a new plugin called 'Puppet Master'. Once installed into LightWave, Puppet Master will allow you to control what points on your object are controlled by which bone. It also allows you to pick points on your object, assign them as separate groups and move them around individually in Layout. Example: you can pick points on a face, save them as "cheek", apply "Puppet Master" to them, pick the cheek points in Layout and then move, rotate or scale them. Puppet Master also allows you to cut your object up into sections at the joints or anywhere else you want, apply bones that will only effect those sections (no more cross influence), and Puppet Master will automatically stitch your joints back together into one SEAMLESS object. You can also cut your object up into sections at the joints and not have to use bones to animate. You can use pivot points for your figure's walking movement, move the pivot points wherever you want for more accurate joint bending; and Puppet Master will stitch all your sections back together into one SEAMLESS object. Puppet Master also allows you to use motion channels to automate your objects joint and muscle flexing movement. Puppet Master works great with Metamation and is a way to have complete control over point groups, bone influence on points, sectional pivot point animation, joint socking and flexing channels all stitched into one seamless object. Lightspeed (800-764-8696) is a main distributor for Puppet Master or you can order it directly from Virtual Reality Pictures (212-337-0910). Retail price is : Alpha $399 - Intel $349 - Amiga $199. Coming soon for the PowerMac.

That's the news for this issue. If you run across an interesting story, press release or news worthy item, please forward a copy to us at lightwavin@qnet.com.

New
V.2.0
CON MOTION

If you work with character animations, with Con-Motion you can make animations easier than ever before.

New Powerful Version 2.0

**New Interface - New Features -
Real Time Interaction with LightWave**

**COME AND SEE OUR WEB PAGE AT http://csprings.com/umv
YOU WILL FIND MORE INFO THERE ABOUT THE PROGRAM.**

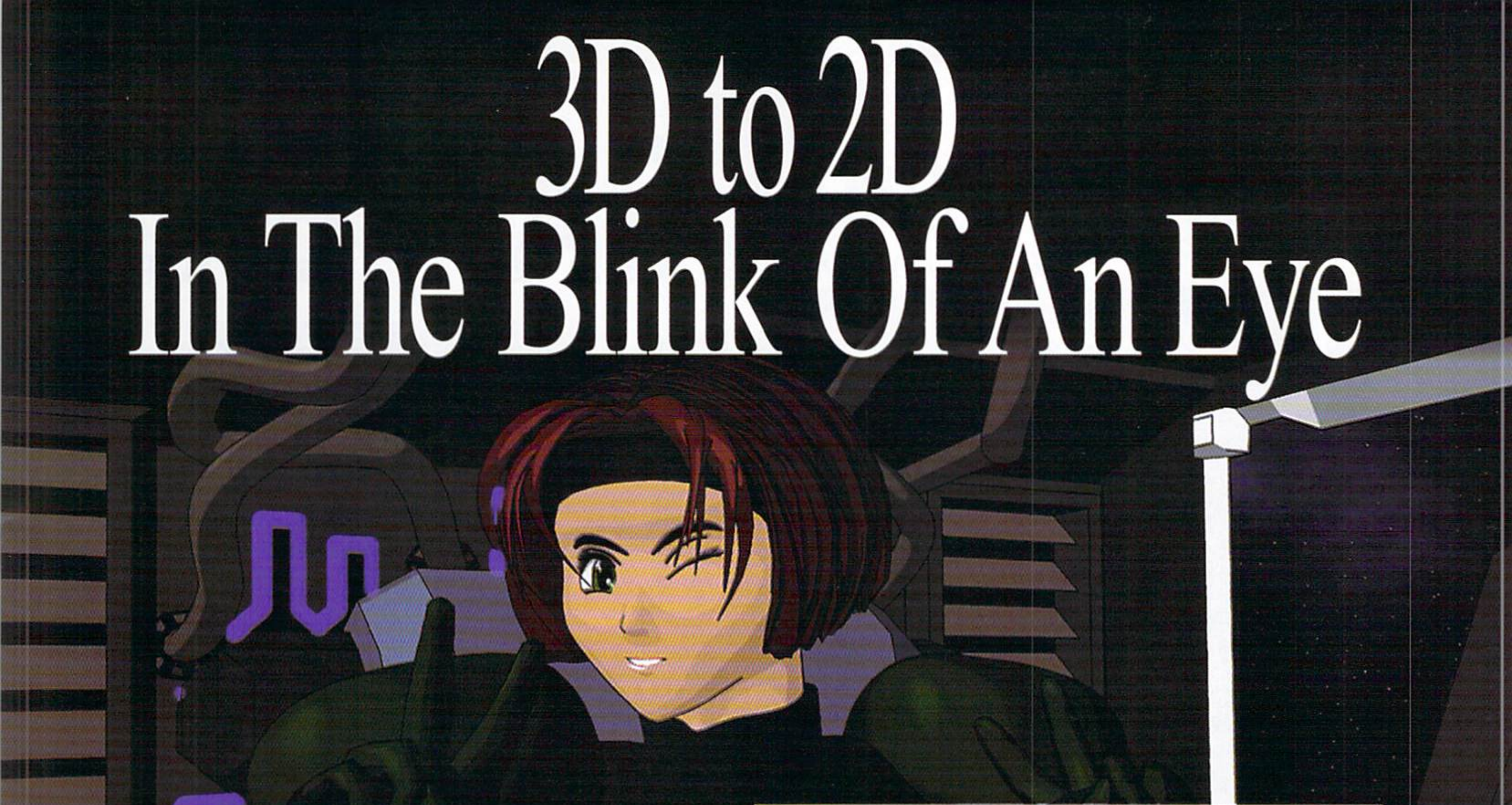
United Magnetic Video

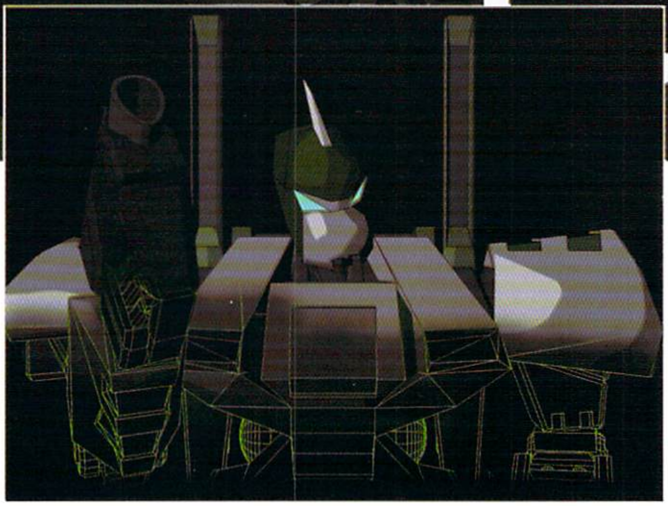
**736 E. Moreno Av. Colorado Springs, CO. 80903
Phone/Fax: (719) 634-4015**

ALSO AVAILABLE FROM LIGHTSPEED
(US ORDERS) 800-764-8696 (ALL OTHER ORDERS) 805-726-3545 (FAX ORDERS) 805-726-3544
Visit our web site at http://www.webcom.com/lghtspd

Light Wave 3D is a trademark of NewTek, Inc. Con-Motion is a trademark of United Magnetic Video

3D to 2D
In The Blink Of An Eye





"LightWave 3D *allows me to achieve a highly stylized look to my animations with relative ease. The cel shader is simple to use yet incredibly powerful. It can not be beat."*

Robert Baldwin
Dark Orb Digital

LightWave 3D is well known by industry professionals for its rendering speed, ease-of-use, multi-platform functionality and image quality, to name a few. But what many don't know is that LightWave 3D's Cel Shader gives users the ability to create fantastic 2D images. Think of the power of a 3D program that can generate a photorealistic image and, with the click of a button, create an image that looks like it has been hand drawn. What's more, the Cel Shader can paint a three-dimensional object so it looks like a cartoon, and then trace around objects and contour lines with variable color and thickness. It even allows you to merge conventional 2D images with 3D animations. And that's just for starters.

Just imagine. Two-dimensional characters interacting with a photorealistic world. Because the Cel Shader blends perfectly with our highly-acclaimed ray tracing renderer, a cartoon element can be made to reflect in a pool of water, cast shadows on a textured wall, or even be refracted through a pane of warped glass. For real flexibility, LightWave 3D's open architecture allows you to mix and match your choice of styles in the same scene - whether it be photoreal, stylized 3D, or 2D cartoon. Best of all, the Cel Shader comes standard with every copy of LightWave 3D - and that's an eye-opening bargain.

Call today and mention this ad to get a free LightWave 3D demo tape.

LIGHTWAVE 3D

Windows 95, Windows NT, Silcon Graphics, Inc., DEC Alpha, MIPS, Amiga...and now Power Mac.

NEWTEK
INCORPORATED
1-800-TOASTER
8 6 2 7 8 3 7

Come see us at NAB Booth # M6618 Outside the U.S.A. call 1-913-228-8000 • FAX 1-913-228-8099 • WEB PAGE http://www.newtek.com • ANONYMOUS FTP SITE ftp.newtek.com.

All trademarks and registered trademarks are the sole property of their respective owners. LightWave 3D is a trademark of NewTek, Inc. © NewTek, Inc. 1997.

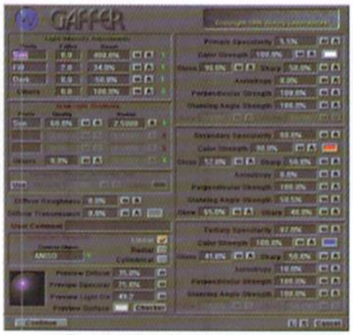
PRODUCT REVIEW

GAFFER: UNCORKING THE BOUNDS OF REALITY

By Walter (Jay) Turberville

Gaffer is a LightWave plugin from Worley Laboratories that provides LightWave with a new advanced and complex shading model. It was first developed for some of the major Hollywood studios as a tool for excluding lights from surfaces and has since evolved to be much more. If you are searching for control over and more variation in how LightWave renders, then your search may be over.

Gaffer is physically one file (gaffer.p) and you install it from the Options Panel just like you would any other Layout plugin (Actually, there is a registration process - but this is simple and straightforward). Once installed, Gaffer shows up in LightWave as two plugins. The first is a Shader Plugin found in the Surfaces Panel called Gaffer and the second is an Image Filter Plugin found in the Effects Panel called Bloom. Gaffer and Bloom work independently of each other and it is best to think of them as separate plugins even though they are delivered in one "package".

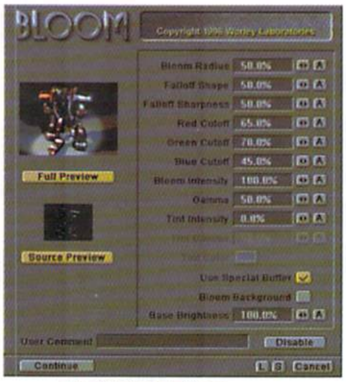


The main interface to Gaffer.

You will find the bulk of features in the Gaffer portion. I counted 50 separate controls on the Gaffer Panel. In fact, the panel is so large that one of the system requirements is an 800x600 resolution display. Here is the short list of what Gaffer does:

- Advanced Specularity
- Selective/Advanced Lighting
- Advanced Diffuse Shading
- Photoreal area light shadows
- Advanced Shadow Compositing

The Gaffer panel is split down the middle with the entire right side dedicated to specularity controls. The rest is on the left side of the panel. The Gaffer adjustments are



Bloom Radius 50.0%
Falloff Shape 50.0%
Falloff Sharpness 50.0%
Red Cutoff 65.0%
Green Cutoff 70.0%
Blue Cutoff 45.0%
Bloom Intensity 100.0%
Gamma 50.0%
Tint Intensity 0.0%
Use Special Buffer ☑
Bloom Background ☐
Base Brightness 100.0%
User Comment

The interface to Bloom.

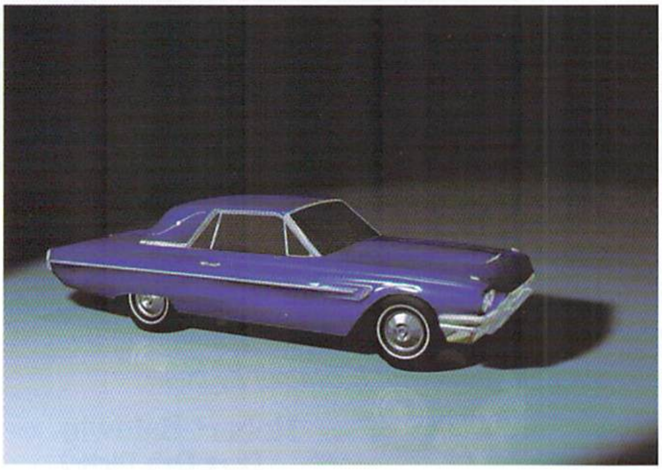


FIGURE 1 - This car shows multiple levels of specularity on the paint to simulate a metallic paint finish and also shows anisotropic specularity on the hubcaps. The lights also use Gaffer falloff and area light shadows, but this effect is very subtle.

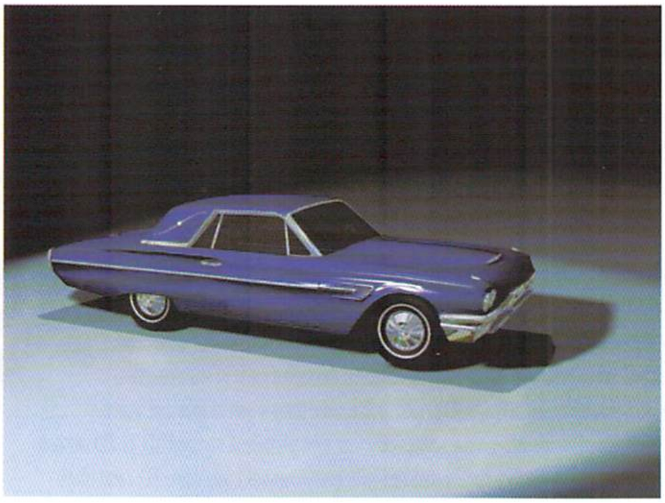


FIGURE 2 -This car is the same identical scene but all Gaffer effects are removed.

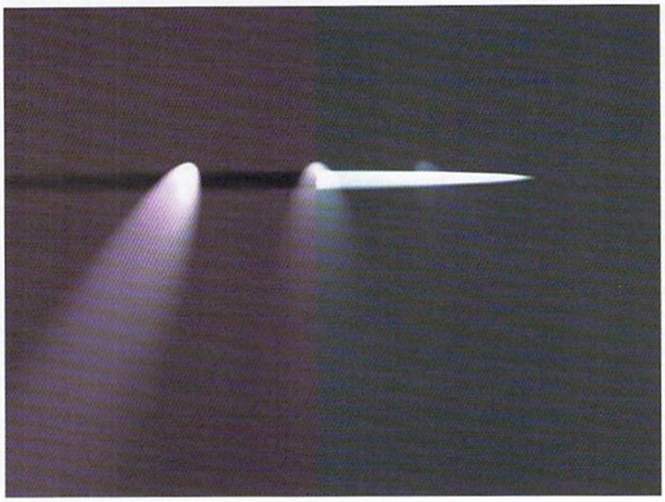


FIGURE 3 - This image shows some of the features of Gaffer's lights. The three beams pointing toward the viewer all have the same brightness and boost values. The leftmost light has a falloff of one, the middle has a falloff of two and the furthest right has a falloff of three. The fourth light that cuts across the other three is set to have a negative value on the left surface and a positive value on the right surface.

previewed interactively on the preview sphere in the lower left hand corner of the panel. There is no "render" button. The preview updates every time you change a setting. The Gaffer preview only shows Gaffer effects though. You won't see your complete surface texture here. According to Steve Worley, this is a limitation of the LightWave plugin interface. However, you can change the color of the preview sphere, the light direction, the diffuse and specular amounts and apply a checker texture to it. While this is not as good as having your actual texture there, it does help. The LightWave texture panel, however, does provide a full preview including Gaffer's effects.

With half of the Gaffer panel dedicated to specularity, it should be no surprise that specularity control is Gaffer's strong suit. Gaffer has three layers of specularity. Each layer has continuously adjustable glossiness, continuously adjustable falloff, Fresnel effect adjustments, continuously adjustable colored specularity and anisotropic specularity.

The example pictures of the '64 Thunderbird show three of these features at work. While the surface colors for each car are identical they look quite different due to the use of colored specularity in multiple layers.. The result is a pretty good simulation of a high gloss metallic paint. I used two layers of broad (between 20% and 40% glossiness) colored (blue) specularity to create the broad, almost luminous, specular effect that simulate the effect that metallic particles in the paint would create. I then added a high gloss (around 90% glossiness) "white" specular highlight to simulate the clear glossy top finish. The other car also uses Gaffer so that the white specularities would match closely, but it only uses the one layer of white which is very similar to the way LightWave would render the scene unassisted. The result is a paint that looks more like gloss enamel or plastic.

The car's hubcaps show another Gaffer feature - anisotropic specularity. I started with one of the standard LightWave chrome surfaces and then added a 100% anisotropic setting using the cylindrical setting. The effect is seen more clearly in the rear hubcaps where you see a distinct specular highlight that extends along the diameter of the hubcap. Anisotropic specularity simulates the effect of fine surface scratches on a surface's specular reflections. The specular highlights are broadened in a direction perpendicular to the scratche's orientation. In this case, the cylindrical setting causes the "scratches" to be concentric circles on the surface of the hubcap. [Figures 1 and 2]

Gaffer's advanced lighting controls provide a lot of flexibility in lighting scenes. All of Gaffer's light controls act on a per surface basis which works well when you have a great number of lights and only a few different surfaces. Unfortunately, it can be cumbersome when you have a large number of surfaces and only a few lights.

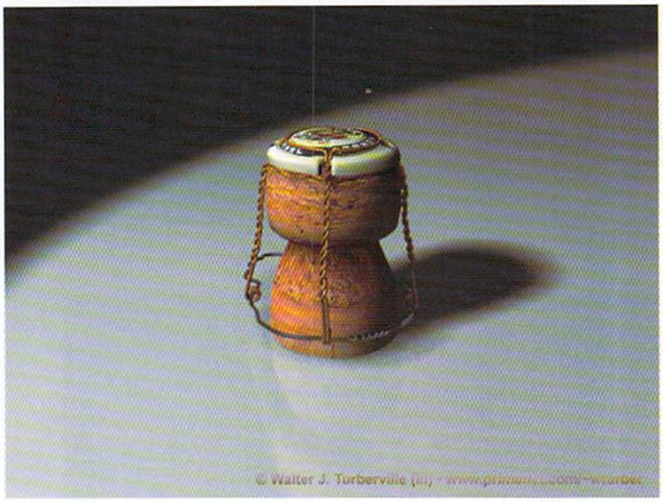


FIGURE 4 - This cork does not use Gaffer at all. It uses Shadow Mapping to approximate the softness of the Gaffer shadows.

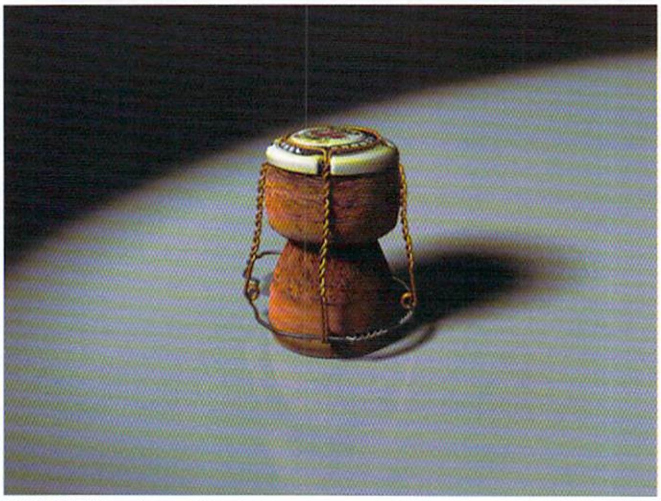
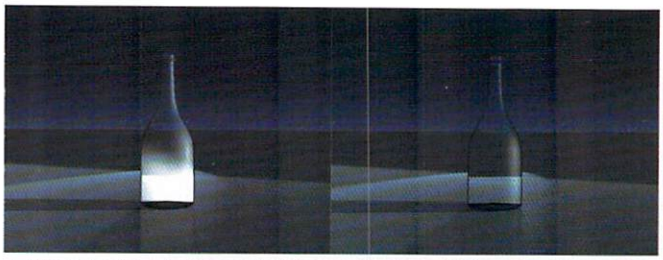


FIGURE 5- This cork uses Diffuse Roughness on the surface and area light shadows. It also uses multiple layers of anisotropic specularity on the brass wires though this has a very subtle effect

Gaffer identifies and groups lights by using the name prefixes of lights in a scene. For instance, if you had a number of spot lights that you wanted to group, you might name them Spot1, Spot2 etc. and then enter the prefix "Spot" into one of Gaffer's three light adjustment boxes. Gaffer will then immediately search your scene and show you how many lights it found with that prefix. Now you can control the intensity of all these lights (for the current surface) by adjusting the Boost values associated to the prefix. Boost values are highly adjustable. I entered values of over 1,000,000% (which can actually be useful when using realistic light falloff). Boost can also be negative. You can have your lights, in effect, suck the light off of a surface. Setting the boost value to 0 means the surface doesn't see the lights at all. Hence, you can exclude lights from affecting a surface while the same light has its full affect on other surfaces.

Advanced falloff control values range continuously from 0.0 (no falloff) to 3.0 (inverse cubed falloff). A value of 2.0 gives inverse square intensity falloff which is a physically accurate model of how point source light intensities diminish with distance which can be useful for lighting scenes where the effect of a light is relatively localized such as a streetlight at night or a candle in a dimly lit room. [Figure 3]

Advanced Diffuse Shading provides two new diffuse surface treatments. The Diffuse Roughness feature replaces the more "normal" diffuse shader with one that produces a noticeable flatter result. Its purpose is to more accurately mimic the way light behaves on a surface that has a matte finish such as skin or unpolished rock. On a recent project, I was having a tough time making an ice-cream surface that looked realistic. I eventually used Gaffer's Diffuse Roughness feature which got me about 75% of the way to a good ice-cream surface. Ice-cream, it turns out, has a surprisingly matte surface (I suspect from suspended milk particle solids) even in a melting state. I also used this feature to make a more realistic cork surface for a champagne cork. The image map I used accounts for a great deal of the realism of the cork's surface, but the Diffuse Roughness added a softness that makes the rendering more realistic. This effect may not be visible in print since the effect is fairly sublte. [Figure 4 and 5]



FIGURES 6 and 7 - The image on the left shows the effects of Diffuse Transmission and to a lesser extent of Diffuse Roughness. The image on the right is the same exact scene but has both Gaffer diffuse settings turned off.

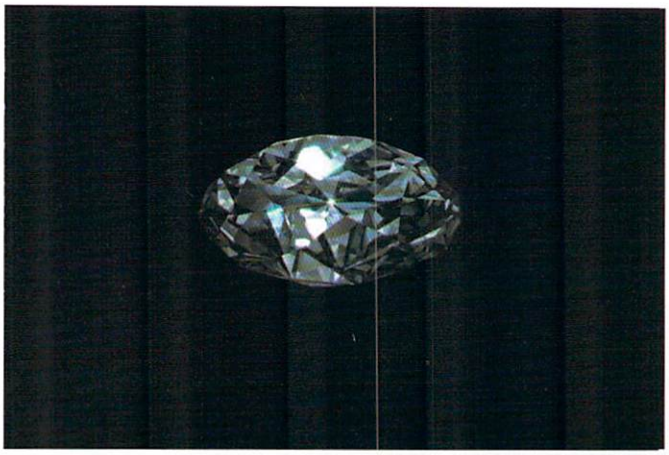


FIGURE 8 -The diamond uses Bloom to enhance the highlights and also uses multiple colored specularity to add color to the specularity.

Gaffer's other surface treatment is Diffuse Transmission which causes transparent surfaces to light up when they are backlit. This simulates the behavior of translucent or diffusely transparent surfaces. The two bottle images are set up identically except for the addition of Diffuse Transmission on the interior surfaces and Diffuse Roughness on the exterior surfaces. The luminous white area on the bottle that used Gaffer is caused by the Diffuse Transmission. [Figures 6 and 7]

Unlike Raytraced shadows which have unrealistically sharp edged and Shadow Mapped shadows which are not cast very accurately and have uniformly soft edges, Gaffer's Area Light Shadows correctly model real world shadows. You can see this fairly clearly in the cork images. Notice how the wire's shadows breaks apart when using shadow mapping but stays nice and tight with Gaffer's shadows. You can also see the cork's shadow is more spread out near the top than near the base of the cork when Gaffer is used. More subtle differences are how the wire's shadows fall across the cork itself and how the shadows are formed around the leading edge of the cork where it sets on the horizontal surface. All of these differences create a more realistic rendering

Soft edged shadows are caused by the fact that real lights sources always have an area. They are not perfect points - which is the way LightWave (and most other 3D apps) treats them. Gaffer allows you to enter a light "size". This light size correlates to the size of a real light source and is used by Gaffer to produce shadows with soft edges that are realistic. These realistic shadows come at a price though. Smooth shadows require a large number of additional samples. Area shadows with a low quality setting have a distinctly grainy appearance that is not realistic. Their appearance is smoothed and improved by increasing the quality setting in the Gaffer Panel or by increasing the degree of anti-aliasing. Both of these methods increase rendering times substantially. In practice, you will find it important to strike a balance between these two controls in order to obtain optimal results You will probably want a fast processor or a lot of time if you include Area Light Shadows in an animation.

The Advanced Shadow Compositing is perhaps Gaffer's simplest feature. It is a simple tool for compositing within LightWave using Front Projection mapping. Gaffer makes fiddling with a surface that is to receive front projection mapping a thing of the past. No more tweaking the Diffuse and Luminous settings. Just apply this feature to the surface and your Front Projection polys will match your background plate exactly. In keeping with the Gaffer theme that more control is always better, Gaffer allows you to adjust the intensity and color of the shadows that you cast on a surface by using this feature as well which is useful in creating a good match with the existing lighting in your projected plates. If you do even a moderate amount of compositing with Front Projection mapping, the time you save using this feature alone should justify Gaffer's purchase price.

Specular Bloom is the second part of the Gaffer package. Bloom is an Image Filter post-process "glow" effect that is applied based on a user specified threshold of brightness. Bloom was designed to give a glow to highly reflective specular highlights like those from metallic surfaces under bright lights. It gives control over the falloff, intensity, radius, tint and a few other things that, frankly, I don't fully understand. But the cool thing is you don't really need to understand the controls that well. Bloom has a very nifty preview window that will give you a thumbnail image of your final image and will provide near instantaneous (depending on CPU speed) feedback on how Bloom settings affect your image. You simply need to do a single render with Bloom applied and the Bloom panel will be loaded with a small preview image. Changing Bloom settings will update the thumbnail image automatically. Bloom can be set to ignore or include a background image. It can also be applied on a "per surface" basis to varying degrees by using the Special Buffers option. The image of the diamond shows a fairly subtle example of Bloom in action (the color in diamond's reflections was created by using colored specularity layers in Gaffer - [Figure 8]). Only the brightest parts of the image are bloomed. Like lens flares, Bloom is a lot of fun and is a feature begging to be overused. It makes beautifully colored bright and shiny metal. There is a downside though. When image resolutions reach 640x480 or more, the Bloom begins to add substantially to render times. Doing your test renders at low resolution is advised unless you have a pretty fast computer. Bloom added about two and a half minutes to the render time of the Textures benchmark scene on a P100 with 48 Mb of ram. It probably won't bring your machine to its knees, but it will slow things down a bit.

The vast majority of Gaffer's features are animateable. You can spot the animateable features easily by the "A" button next to it. I counted forty "A" buttons in Gaffer and eleven in Bloom. Clicking on an "A" button brings up an Advanced Definition panel which allows you to animate the associated value in three different ways. The first and perhaps most powerful is that you can link a value to a named object's motion. This can be a regular LightWave object or a named Null object. The numerical value of the attribute will vary from 0 to 100% as the object's behavior changes from 0 to 1. The object's X, Y, or Z position, size, distance from the origin, average size for 30 frames or separation from another referenced object can be used. One object can be used to animate an unlimited number of values and/or surfaces. You can use the LightWave Motion Graph panel for the object if you prefer that to animating the object directly in Layout. The other two ways to animate a value are through a linear change over time which is much like a LightWave velocity setting and through a random value generator.

Both Gaffer and Bloom also have two small buttons labeled with an "S" and an "L" located in the lower right hand corner of each panel. These buttons load and save the current panel settings. These are not the same as surface settings. Only the Gaffer or Bloom information is saved or loaded. I wish that every LightWave panel had this feature. Wouldn't it be nice to be able to transfer just the Bump Map information from one surface to another quickly and easily?

Gaffer is very finished and stable as version 1.0 software goes. It was released with a rather small number of quirks and a couple of bugs considering the complexity of what it does. Most of these problems have been eliminated and many of them were the result of problems or inconsistencies within LightWave itself. Unfortunately, I am unable to report the status of some of these bugs and their fixes on a firsthand basis. NewTek is currently beta-testing a patch that will bring LightWave 5.0 to version 5.0z. This patch and the latest Gaffer version are claimed to squash all but some rather obscure Gaffer bugs (Wacom support and some display problems - neither of which I have experienced). Most (if not all) of these bugs are documented on the Worley Laboratories Web page (www.worley.com - where you can find online tutorials, sample images and more Gaffer information). The latest Gaffer and the LightWave patch should be available by the time you read this.

Control is what Gaffer is all about. Sometimes that control is subtle. Sometimes not. Either way, this control does require more effort from the LightWave artist using it. The images shown here just start to show the added control that Gaffer offers. Gaffer's shader is different than the one built into LightWave and it took me a little while to get used to its different "response". The extra effort in learning how it responds was well worth it though. After spending almost two months with this plugin, I now find it hard to imagine not having it.

Walter Turberville is a partner and animator at Studio 522 in Phoenix, AZ.

Gaffer Intel ($195) - Alpha ($295) is available from:
Worley Laboratories
405 El Camino Real Suite 121
Menlo Park, CA. 94025
800-720-7584 (USA) or 415-322-7532
(Outside USA)

CD-ROM

Contained on this issue's CD-ROM are all the images in this article plus a few others that aren't. We've also included several animations which show off Gaffer's power. Also on the CD-ROM are 6 tutorials for Gaffer including all the Light-Wave objects & scenes that you'll need!

QUICKIES

Here's a way to create a chain link fence to be used in LightWave.

Go into your favorite paint program and draw out your chain links. The closer your animation will be to the fence the higher the resolution should be in the creation of the fence. You'll need to create two versions of your chain link image. One version will be your full color version (the way you want it to look in your animation). The next version should be a black and white version, with the chain links being completely white and the holes being completely black. Make your black and white version from the color version, so they are exactly the same shape. Next, create a flat polygon for every section of fence that you need. Under the images menu, import both images. Go into the surfaces panel and enter the color version as the image map for the fence. Select auto sizing. Now go to the clip map panel and choose the B&W version as your clip image. Again use auto sizing. Do a test render and what you should see is that the black parts from the B&W version has cut through the color version, leaving just the nice silvery chain link fence you drew out. From a distance, this should look convincing. Up close, you may lose the illusion of depth and may need to extrude the fence plain a bit and tweak with the images a bit.

Fractal noise is random and never repeats. What if a project called for 'repeating' fractal noise so that you could loop an animation to play over and over. Here are some ways to do it:

Method 1

Create a flat plane object and surface it with the appropriate fractal noise you desire. Next set the fractal noise to world coordinates. Move the camera towards the plane object until it fills the entire screen and key frame the camera. Now parent and target your camera to the object. And finally, you just need to animate the object moving through space in a circular motion so that your starting and ending points are the same. Render out the animation and you now have image sequences of looping fractal noise that you can use in your animations.

Method 2

A quicker method than the one used above is to map the fractal noise to a tube, move the tube towards the camera until if fills the entire screen and then keyframe it in position. You then rotate the tube 360 degrees and keyframe it at the frame that corresponds to how long you want the first loop to last (i.e. 30 frames for one second, 90 frames for 3 seconds, etc.). Render out the animation and again you have some looping fractal noise image sequences to use in your animations.

Have you looked up at the stars lately? Have you noticed how our atmosphere causes the stars to twinkle here and there. This is how you can re-create it in LightWave.

Load up your starfield object and set the luminosity to 100%. Apply luminosity fractal noise to your star surface and set the frequencies to 1. Set the value of the texture as dim as the faintest star you want and then give it a SMALL velocity (start with 0.01 and adjust it from there to match your specifications) in any axis. If you render out a sequence, you should see that the stars will appear to have a varying brightness which will change over time, giving them a "twinkling" appearance.

Have you ever wanted to have letters in a word appear one at a time in a Lightwave animation? You could model each letter of the word individually and create individual motion paths or transparency envelopes to make the letters appear, but there's a way that's easier to implement using a front projection mask.

In Modeler, create the word as a single object and save it as Word.lwo or something similar. Put Word.lwo in a background layer and create in the foreground a single rectangular polygon that's slightly larger than Word.lwo, just enough to cover the word object.

Reposition the rectangle so that the right edge is at X coordinate 0. This puts the pivot point on the right edge. Give the rectangle a surface name of WordMask and save the object as WordMask.lwo.

In Layout, create your scene using any objects, lights, or backgrounds you need EXCEPT for Word.lwo. Leave it out for now. Render a single frame in your final output resolution, giving it the name FrontProj. (It'll get created as FrontProj001.)

Now load Word.lwo and WordMask.lwo into your scene. Position Word.lwo then position WordMask.lwo just barely in front of Word.lwo so that it covers it completely.

From the Images panel, load FrontProj001. From the Surfaces panel, select the WordMask surface and go to the Surface Color Texture Map panel. Select a texture type of Front Projection Image Map and select FrontProj001 as the Texture Image. Click Use Texture to return to the Surfaces panel. Set Luminosity to 100% and all other levels to 0%. From the Objects panel, turn off all shadow options for WordMask.lwo.

Render the scene. It should look just like FrontProj001. WordMask.lwo covers Word.lwo and with it's front projection map, it blends perfectly into the scene.

Now for the magic. In Layout, select the WordMask.lwo object and set a key frame at zero. Then go to frame 30. Using the Stretch tool, set the X size to zero and set a key frame. Because the pivot point is on the right edge of the object, the right edge stays in the same place and the left edge shrinks toward it.

Make a preview and play it. You should see the mask object shrinking over the 30 frames to reveal the Word.lwo beneath it. When you render and view the animation, the letters seem to appear out of nowhere.

If left alone, it's very likely that the left edge of WordMask.lwo will reveal only part of a letter at some point. If necessary, you can set key frames for WordMask.lwo so that it always reveals an entire letter at a time.

Another useful option is to animate a lens flare that moves along with the left edge of WordMask.lwo. When animated, it looks like the letters are being written by the flash of light moving across the screen. The lens flare also helps hide the sharp edge of the mask.

COMPANY PROFILE

Dynamic Realities

Company: Dynamic Realities

Date company founded: November 1994.

Number of years company has been in the LightWave business: Since November of 94

Number of Employees: Currently six employees are on the payroll.

Role of employees: Andy Frerking, President & founder of Dynamic Realities decided to start the new company as a spin off to his existing company, Images In Motion which was a Video Toaster reseller at the time. He basically runs the company, prioritizes and schedules development timelines, slates new product ideas, supervises production schedules and heads sales and marketing. Andy designed most of the web page at their internet site and does most of the artwork and layout for advertisements and product packaging.

"Dave Vrba is our lead software engineer (a.k.a. software chef). Dave has been with Dynamic Realities from its beginning. He did a bulk of the design and programming work for Impact and Particle Storm and is currently porting our plug-ins to the PowerMac version of LW as well as designing updated versions of IMPACT! and Particle Storm."

"Jason Sharpee is our custom database programmer as well as Unix specialist. Jason has been with Dynamic Realities since May of 96. He set up our firewall to the internet, manages our internet connection, programs CGI scripting for the automated registration and sales web pages and is involved in the SGI port of our products."

"Jim Marten has worked on and off since March of 1996. He wrote most of the Particle Storm manual and edited the Impact! and Lock & Key manuals."

"Tiffani Schroeder is the newest addition to the DR staff. She has been with the company since January and is the assistant office manager, assistant to marketing and sales and is starting to get involved with ad and literature design."

Dynamic realities is located in the Great White North...Waukesha (pronounced 'Walk-a-shaw'), Wisconsin, midway between Milwaukee and Madison. We're told Andy hates the weather there.

As an animator, Andy saw a need for animation utilities that would assist the user in creating special effects that would otherwise be impractical to create. With that in mind, he began work on his first product.

Impact! for the Amiga was their first product and version 1.0 was released in July of 1995. They then ported Impact! to Intel PC and DEC Alpha platforms, which was released August 1995. Their most popular, Particle Storm, was released July 1996.

From left to right: Jim Marten, Tiffani Schroeder, Andy Frerking, Dave Vrba, Jason Sharpee

"IMPACT! was created to fill a need animators had for a dynamics package that worked with LightWave. It was moderately successful. Particle Storm came from another need: to quickly and easily produce particle effects. The power of particle storm was directly related to the desires of the animation community. To date, it is our most successful product", says Andy.

What are your current products and what would you like to say about them?

"Particle Storm is great. Probably the most popular LW plug-in sold to date. It's real-time feedback is fun to use and easy to learn. Great effects can be achieved within minutes after installation. Impact! is rigid body dynamics with collision detection. Lock & Key is useful for the character animator that needs dynamic parenting. ShaderMan is 25 procedural shaders that plug into the LW shader interface and offer beautiful surfaces based on RenderMan algorithms. Stripper is a scene file management, transfer, and backup utility that offers hassle free bundling of animation projects."

What are some of the things you will be working on in the future?

"Our PowerMac, SGI, and Sun versions of our plug-ins should be near shipping by the time people read this. We also have new versions of Impact and Particle Storm which should be shipping by end of summer 1997."

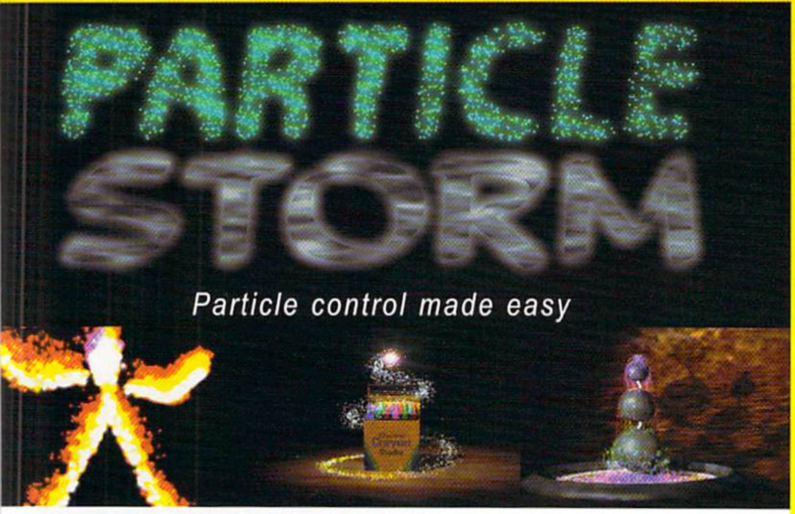
Where is Dynamic Realities headed or where do you want it to be?

"We have become the leading third party developer for LW, offering more products and wider distribution than any other developer. With the new products we have scheduled, it is our intention to continue this well into 1998."

Is there anything else you would like to add?

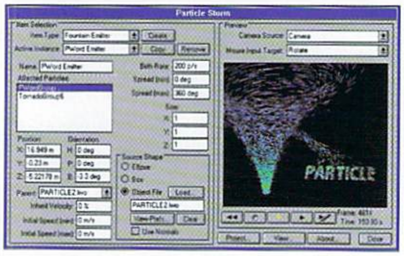
"We are always listening to the needs of the animation community. If there is an idea that needs a reality, come to Dynamic Realities. Visit our web site at www.dynamic-realities.com for the latest release info on new products!"

LightWave 3D Utilities Made Easy...


PARTICLE
STORM

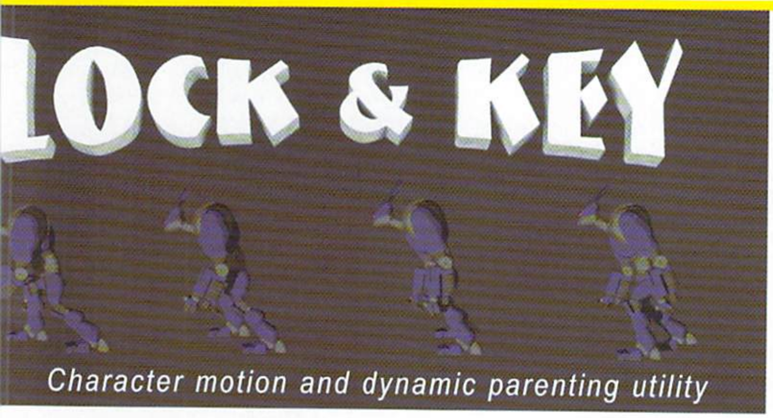
PARTICLE STORM

Particle control made easy


Particle Storm
Item Selection
Item Type: Fountain Emitter
Create
Active Instance: PWord Emitter
Copy
Remove
Name: PWord Emitter
Attached Particles
TornadoGroup6
Birth Rate: 200 p/s
Spread (min): 0 deg
Spread (max): 360 deg
Size
X: 1
Y: 1
Z: 1
Position
X: 16.949 m
Y: 0.23 m
Z: 5.22178 m
Orientation
H: 0 deg
P: 0 deg
B: 3.3 deg
Parent: PARTICLE2.lwo
Inherit Velocity: 0 %
Initial Speed (min): 0 m/s
Initial Speed (max): 0 m/s
Source Shape
○ Ellipse
○ Box
● Object File
Load
PARTICLE2.lwo
View Path
Clear
☐ Use Normals
Preview
Camera Source: Camera
Mouse Input Target: Rotate
PARTICLE
Project
View
About
Done

Real-time previewing of particle effects while adjusting parameters. Supports flocking & swarming, wind with swirling, collisions with objects and more!

Available for Intel, Alpha, and MIPS.



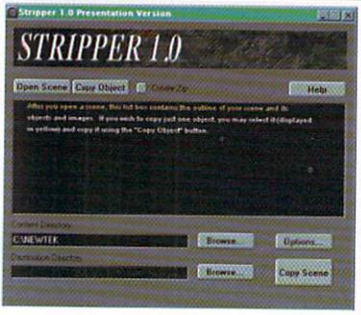
LOCK & KEY

Character motion and dynamic parenting utility

Eliminates foot slide during character walks and Gimbal lock. Parent any item to any other item on a per frame basis. Available for Intel, Alpha, MIPS, and Amiga.

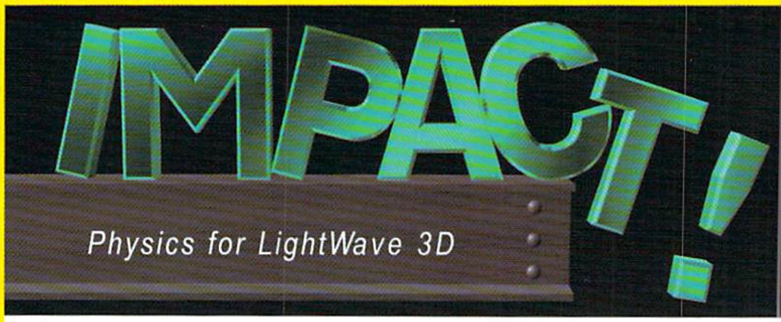
Stripper

Scene backup and transfer utility for LightWave 3D


Stripper 1.0 Presentation Version
STRIPPER 1.0
Open Scene
Copy Object
Help
C:\NEWTEK
Browse...
Options...
Browse...
Copy Scene

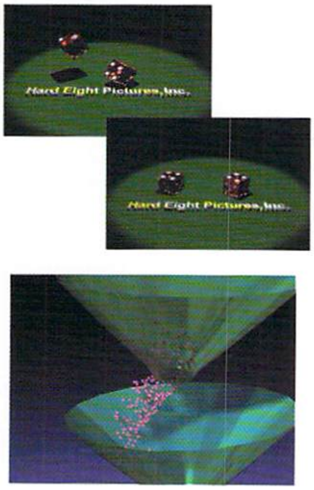
Stripper easily bundles a scene file and all support files including objects, images, and Particle Storm files that are referenced into one ZIP file. All directory hierarchies are maintained.

Available for Intel, Alpha, and MIPS.



IMPACT!

Physics for LightWave 3D


Hard Eight Pictures, Inc.
Hard Eight Pictures, Inc.

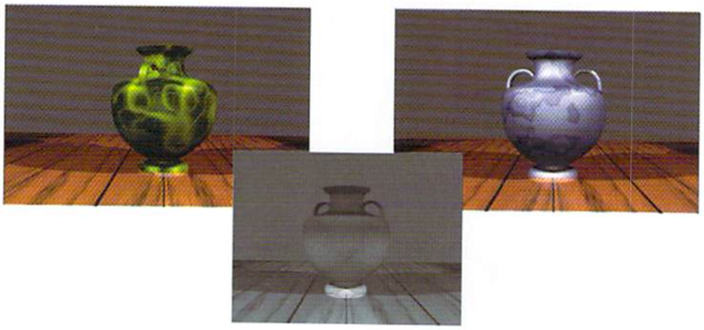
Add realistic motions based on real world physics to your objects. Full collision detection is supported.

Use 'Engines' to modify an object's behavior by influencing forces around it. Choose from Gravity, Spring, Thruster, Force Field, Drag and more.

Available for Intel, Alpha, MIPS, and Amiga.

ShaderMan

20 Procedural shaders for LightWave 3D



Twenty RenderMan shaders for LightWave 3D including wood, plank, several marbles, planet, metallic, plastic and many more!

Available for Intel, Alpha, MIPS, and Amiga.

Call 800-944-5520

Dynamic Realities

21800B Doral Road
Waukesha, WI 53186, U.S.A.
414-798-9400 Direct
414-798-9403 Fax
dynreal@aol.com
http://members.aol.com/dynreal

All products mentioned are trademarks of their respective companies. So there.

TECTONICS

A STUDY IN 3-D CONSTRUCTION

by Kyle A. Thatch

THE TURNING OF THE SCREW

Welcome to the first of many installments of TECTONICS, a study in 3-D construction. You may remember my Modeler column Model Shop that appeared in VTU and LightWave Pro. Though the name and writing location have changed, I will continue to teach the Fundamentals of LightWave's Modeler Program. This issue we look at an object that I know everyone has, a screwdriver. We will be using the Lathe tool along with the Boolean Subtract Tool to create a common household tool.

Before we can begin, we need to make a few adjustments to the Modeler program. Start by hitting “o” (for Options), and setting the polygons to “one-sided “ and “automatic.” Make sure curve division is set to “coarse,” and the number of undo levels is “15.” (LW 4.0 and 5.0 only). Hit “OK” to close the options requester. Next press “'d” (for Display), and set the unit system to “metric.” Click “'OK” again, and we are ready to begin making the screwdriver.

LATHING THE HANDLE

Starting in layer 1, go to the Polygon Menu and select “Points.” Press “n” (for Numeric) and enter the following:

	X	Y
1.	0.0	4.7000 cm
2.	2.7069 mm	4.6837 cm
3.	5.3097 mm	4.6353 cm
4.	7.7085 mm	4.5568 cm
5.	9.8111 mm	4.4510 cm
6.	1.1537 cm	4.3222 cm
7.	1.2819 cm	4.1753 cm
8.	1.3608 cm	4.0158 cm
9.	1.3875 cm	3.8500 cm
10.	1.3875 cm	-1.7107 cm
11.	1.2814 cm	-1.8661 cm
12.	1.1944 cm	-2.0555 cm
13.	1.1297 cm	-2.2717 cm
14.	1.0899 cm	-2.5061 cm
15.	1.0764 cm	-2.7500 cm
16.	1.0899 cm	-2.9939 cm
17.	1.1297 cm	-3.2284 cm
18.	1.1944 cm	-3.4445 cm
19.	1.2814 cm	-3.6339 cm
20.	1.3875 cm	-3.7893 cm
21.	1.3875 cm	-4.725 cm
22.	0.0	-4.725 cm

Remember to hit “Enter” to make the points after you enter each set of coordinates. Now select the points in the order they were created and hit “p” (for Polygon). Go to the Multiply menu once more and select Lathe; then press “n” (numeric.) Set sides to 32 and the axis to Y, and press “OK.” Hit “Enter” to Make. You have just lathed the handle.

Next, lasso the bottom of the handle, go to the Polygon menu and select “Merge.”

Press “q” to bring up the Surface panel and name the polygons “Handle-Flat”. Next press “ to invert the selection and, again, press “q.” Name these polygons “Handle-Smooth.”

Now press “2” to go to layer 2. Go to the Objects menu and click “Disc,” then “Numeric,” and enter the following:

Sides= 32   Segments= 1
Bottom= -5 cm   Top= 5 cm
Axis= Y
Center X= 1.75 cm   Y & Z= 0.0
Radii: X & Z= 5.25 mm   Y= 0.0

After entering the above, hit “OK” and “Enter” to make the cylinder. Before continuing, name (q) the polygons of the cylinder “Handle-Cuts-Smooth.”

Finally, we'll use the Array tool to make several copies of the cylinder rotated around the center of the handle. Go to the Multiply menu and select Array then Numeric. Set array type to Radial, number to 8 and axis to Y. Press “OK” to make the array. Press “1” to go to layer 1. Next, hold down the “Alt” key and press “2” to put layer 2 in the background. Select “B” (for Boolean), and “Subtract;” then press “OK.” After the operation is complete, hit “m” to merge points, then press “Shift-S” (for Save As) and save the object “Handle.lwo.” If you did everything correctly, your handle should look like Figure 1.

TWO HEADS ARE BETTER THAN ONE

Now let's make a flat head screwdriver shaft. Go back to layer 2 and hit “z” (for Delete) to clear out all polygons. Next go to the Objects menu and select “Disc” then “n” (for Numeric). Enter the following:

Sides= 32   Segments= 1
Axis= Y
Bottom= 0.0   Top= 2.4 cm
Center X, Y & Z= 0.0
Radii X & Z= 2.975 mm Y= 0.0

Make sure you press “Tab” or “Enter” after you type in each number. When you're finished, click “OK” to and “Enter” to make the cylinder. Now lasso the top of the cylinder, and press “h” (for Stretch). Enter 1.42 for the X and Z factors, and click “OK.” Next, press “b” (for Bevel) and enter 0.0 for inset and 1.25 cm for shift. Click “OK” again. Hold down the “Shift” key and lasso the bottom of the cylinder. Name (q) the polygon surfaces “Flat.” Finally, hit “ to invert the polygon selection. Name these polygons “Smooth.”

To complete the Screwdriver head we need to use a Boolean Operation. Go to layer 3, choose "Box" from the Objects menu, select "Numeric" and enter the following numbers:

LOW	HIGH	SEGMENTS
X= 4 mm	X= 1 cm	X= 1
Y= 8 mm	Y= 4 cm	Y= 1
Z= -4 mm	Z= 4mm	Z= 1

Hit "OK" then "Enter" to make the box. To name the surfaces, press "q" to call up the surface window, select "Flat" from the list of surface names, then press "OK."

We need to rotate (y) the box into the proper position. Hit (n) and enter Z for the axis, -5.0 for the angle, X= 6.8417 mm and Y= 2.4473 cm. Next go to the Multiply menu and select "Mirror." Press "n" for numeric, and enter X for the plane and 0.0 for the position. If everything is correct, you should have something similar to Figure 2.

Press "2" to go to layer 2. Hold down the "Alt" key and press "3" to put layer 3 in the background. Select "Shift-B" (for Boolean Operators), pick "Subtract" and then press "OK." To complete the operation, press "m" to merge points. Go back to layer 3 and rotate the boxes 90 degrees. The quickest way to do this is to place the cursor in the middle of the Top View (make sure the coordinates window says 0 on both X and Z axes) then press "r" to rotate 90 degrees. In the Left View, delete (z) the box on the left. Move (t) the remaining box -1.5 mm on the Z axis. To complete the new box position, rotate (y) the box on the Z axis. Hit "n" and enter 1.0 for the angle, 2.4706 cm for Center Y and 5.1759 mm for Center Z.

Before we use the Boolean Operator again, we need to use the mirror tool to add a second box. Do it the same way you did before. When you're finished, call up the Surfaces Panel (q), and name the polygons "Flat."

To finish the flat head shaft, place layer 2 in the foreground and put layer 3 in the background. Select "B" (for Boolean), then pick "Subtract" and "OK." Merge points, and that's it - well, almost. Lasso the bottom polygon and hit "b" (for Bevel) Enter 0.0 for inset and 8 cm for shift. Now hit "F2" to center the shaft in the tri-view, and press "y" (for rotate) and "n" (for numeric). Enter X for the axis, 180 degree for angle and 0.0 for X, Y and Z Centers. Now save ("Shift-S") the object as "Flat-Shaft." See Figure 3 see how your results compare to the finished flat head shaft.

You say you want a Phillips head shaft instead? Go to layer 4 and enter the following to make a cylinder:

Sides= 32 Segments= 1
Axis= Y

Bottom= -5.8 cm Top= 5.8 cm
Center X, Y & Z= 0.0
Radii X & Z= 3.0 mm Y= 0.0

Remember to hit "Enter" to make the cylinder. Select the bottom polygon and use "Bevel" with an inset of 0, and a shift of 3.5 mm. Now stretch (h) the new bottom polygon 0.25 on the X and Z axes. Name (q) the surface "Flat." Next, press " to invert your selection and name these polygons "Smooth." Now go to layer 5 and make another cylinder using the following numbers:

Sides= 32 Segments= 1
Axis= Y

Bottom= -6.18 cm Top= 5.2 cm
Center X, Y & Z= 0.0
Radii X & Z= 1.5 mm Y= 0.0

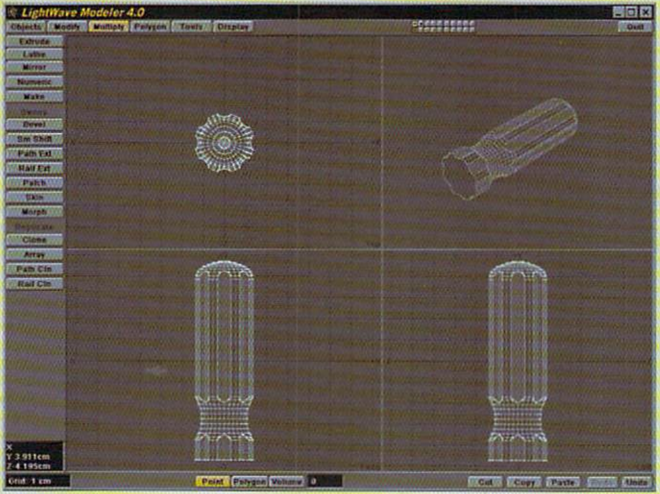

LightWave Modeler 4.0
Objects
Modify
Multiply
Polygon
Tools
Display
Quit
Extrude
Lathe
Mirror
Numeric
Make
Bevel
Sm Shift
Path Ext
Rail Ext
Patch
Skin
Morph
Clone
Array
Path Cln
Rail Cln
Grid: 1 cm
Point
Polygon
Volume
Cut
Copy
Paste
Undo

FIGURE 1

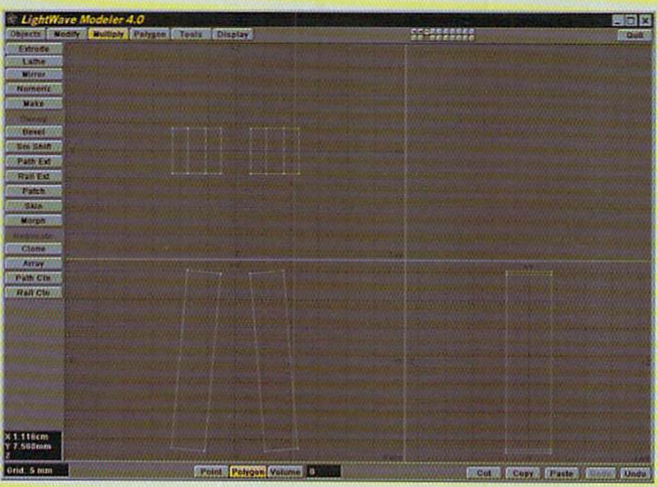

LightWave Modeler 4.0
Objects
Modify
Multiply
Polygon
Tools
Display
Quit
Extrude
Lathe
Mirror
Numeric
Make
Bevel
Sm Shift
Path Ext
Rail Ext
Patch
Skin
Morph
Clone
Array
Path Cln
Rail Cln
Grid: 5 mm
Point
Polygon
Volume
Cut
Copy
Paste
Undo

FIGURE 2

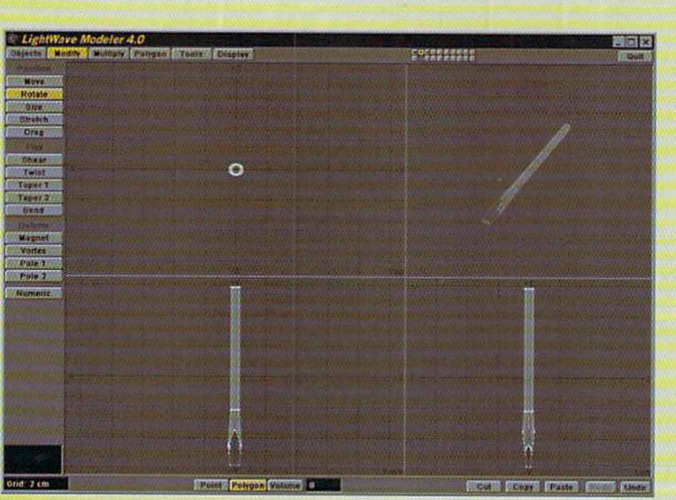

LightWave Modeler 4.0
Objects
Modify
Multiply
Polygon
Tools
Display
Quit
Move
Rotate
Size
Stretch
Drag
Shear
Twist
Taper 1
Taper 2
Bend
Magnet
Vortex
Pole 1
Pole 2
Numeric
Grid: 2 cm
Point
Polygon
Volume
Cut
Copy
Paste
Undo

FIGURE 3

Name the polygons "Smooth " before you continue. Next, rotate (y) the cylinder on the Z axis, 15 degrees for the angle, and -6.18 cm for the Y Center. Now move (t) the cylinder 2 mm on the X axis and -200 um on the Y axis.

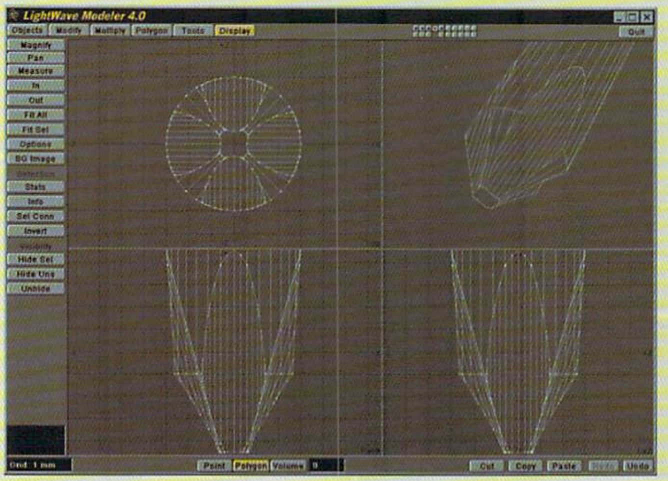
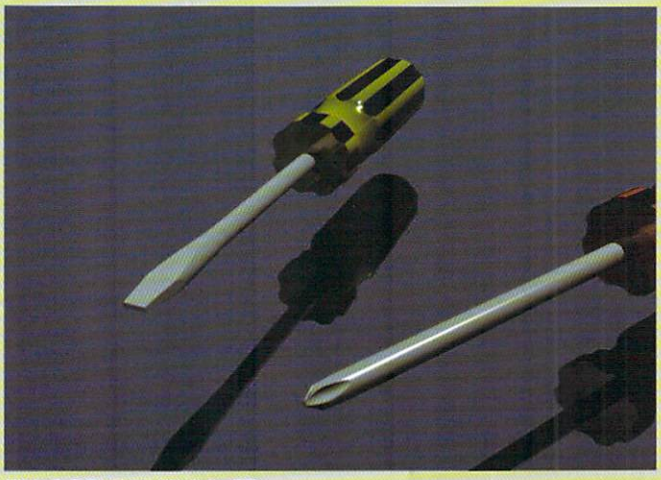

LightWave Modeler 4.0
Objects
Modify
Multiply
Polygon
Tools
Display
Quit
Magnify
Pan
Measure
In
Out
Fit All
Fit Sel
Options
BG Image
Selection
Stats
Info
Sel Conn
Invert
Hide Sel
Hide Uns
Unhide
Grid: 1 mm
Point
Polygon
Volume
Cut
Copy
Paste
Undo

FIGURE 4



FINAL RENDERED IMAGE

All we need to do now is make a radial array of the cylinder 4 times on the Y axis with a center of 0. Press "4," then "Alt-5" to put layer 4 in the foreground and layer 5 in the background. Hit "B," for Boolean, pick "Subtract" and "OK."

Merge points and save the object as "Phillips-Shaft.lwo." If all is well you should have a shaft much like the one in Figure 4.

WRAPPING UP

When you load your objects into Layout make sure that you parent the shaft to the handle then move it into place and keyframe it. I have used the silver surface for both shaft objects, while making the handle smooth and flat surfaces yellow. For the handle cuts surface, I used black. Play around with transparency with the handle to get a plastic look. Make sure to make the objects double sided if you do this.

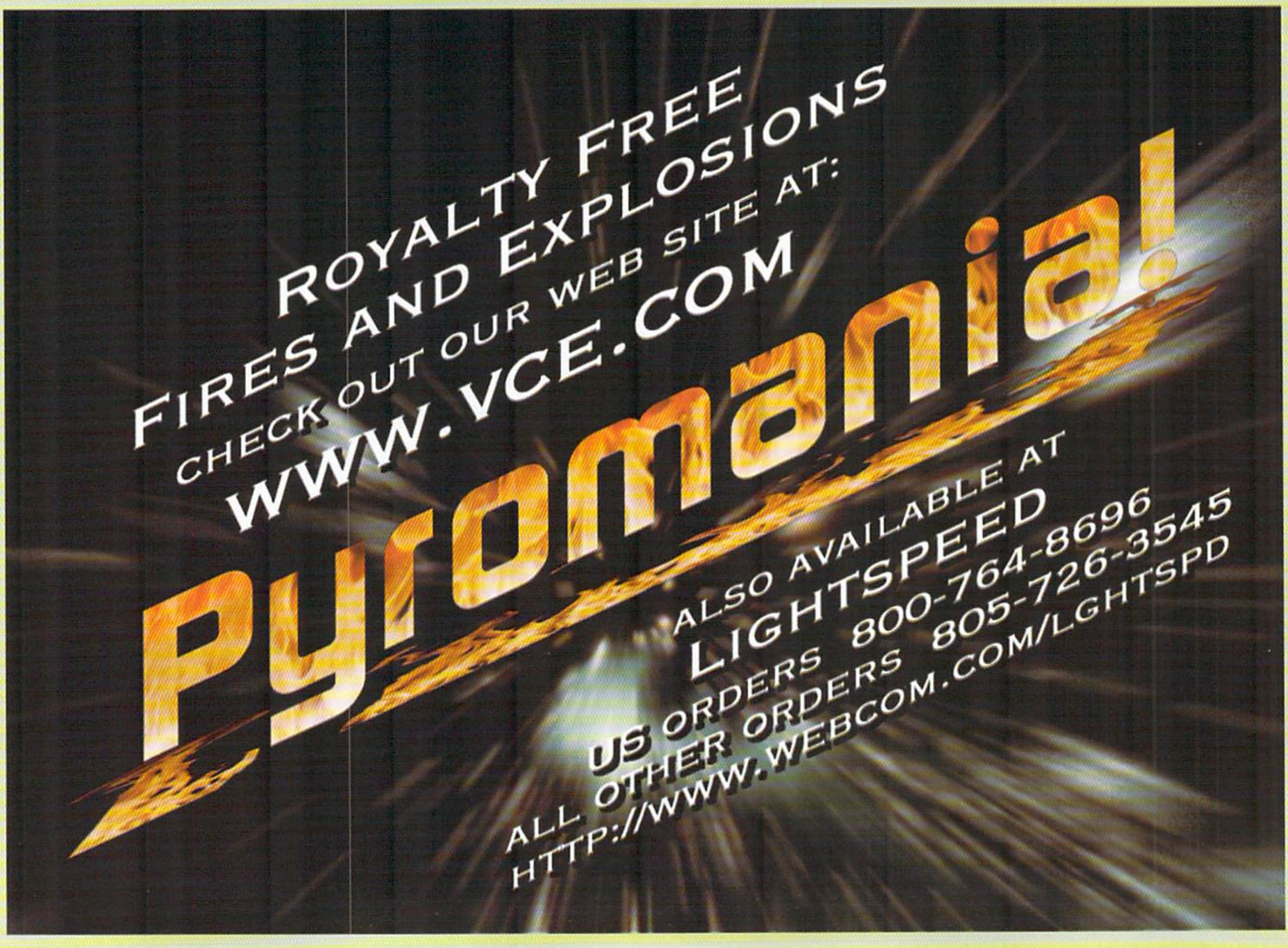
If you have any questions or ideas for future TECTONICS sessions let me know. Until next time good luck with your modeling and don't forget to measure.

Kyle A. Thatch is President of MAGI Imaging Inc. A Louisville, Kentucky based Animation and Graphics Studio. Kyle can be reached for comment at:

Voice - (502) 893-7517 E-Mail - bandicoot@mindspring.com

Mail - MAGI Imaging Inc.

2244 Frankfort Avenue Louisville, KY. 40206


ROYALTY FREE
FIRES AND EXPLOSIONS
CHECK OUT OUR WEB SITE AT:
WWW.VCE.COM
Pyromania!
ALSO AVAILABLE AT
LIGHTSPEED
US ORDERS 800-764-8696
ALL OTHER ORDERS 805-726-3545
HTTP://WWW.WEBCOM.COM/LGHTSPD

REPLICA Technology

The 3D Object Company

Replica Technology's 3D Object Libraries are the most comprehensive collections available. Every detail is attended to, nothing is overlooked. ***Replica Technology's*** 3D Objects are real-world scaled, completely textured and fully animatible, making them ready to just load and render.

The Wright Collection

Capture the Spirit of the Master...

The Wright Collection captures the spirit of this incomparable master through simple and unified models utilizing natural materials and finishes. The basics of Wright's designs, including furnishings, textiles and room spaces are all represented in this collection. As a complement to any interior environment, The Wright Collection is unequaled.

The Wright Collection

Includes:

- 145 Real world scaled, beautifully textured models.
- Over 50 texture maps of custom textiles by Wright.
- All object hierarchies are intact.
- Four Room Scenes from such famous Wright houses as the Taliesin, Robie, Midway Gardens & Coonley Houses.
- Complete lighting section included.

REPLICA Technology
3D Object Library
The Camelot Collection
REPLICA Technology
The Wright Collection
REPLICA Technology
Interior Design Collection

Call ***LightSpeed*** Today for Yours!!!

2763 West Avenue L Suite 172., Lancaster, CA 93536
US Orders: 800-764-8696
Other Orders: 805-726-3545
Fax Orders: 805-726-3544
Web Site: Http://www.webcom.com/lghtspd

The Interior Design Collection

The Home of Your Dreams...

The Interior Design Collection has everything you need to create complex residential and office scenes.

The Interior Design Collection

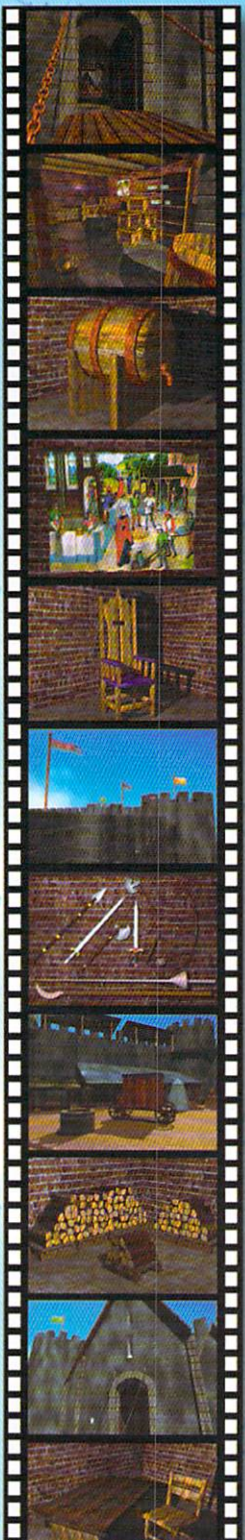
Includes:

- 50+ Living Room, Dining Room and Bedroom Furniture objects.
- 50+ Bathroom and Kitchen objects including Appliances.
- 50+ Office Furniture objects & Furnishings.
- Four complete Homes with working Doors and Windows.
- 120+ Construction items like windows, doors, stairs, walls, moldings, fixtures, etc.

Create your own home environment!

The Dark Ages Come to Life...

The Camelot Collection brings the mystery and chivalry of the Middle Ages to your favorite 3D application. Historically accurate models, vivid photo-realistic textures and a wealth of preset scenes make this the most complete medieval collection yet.



The Camelot Collection

The Camelot Collection

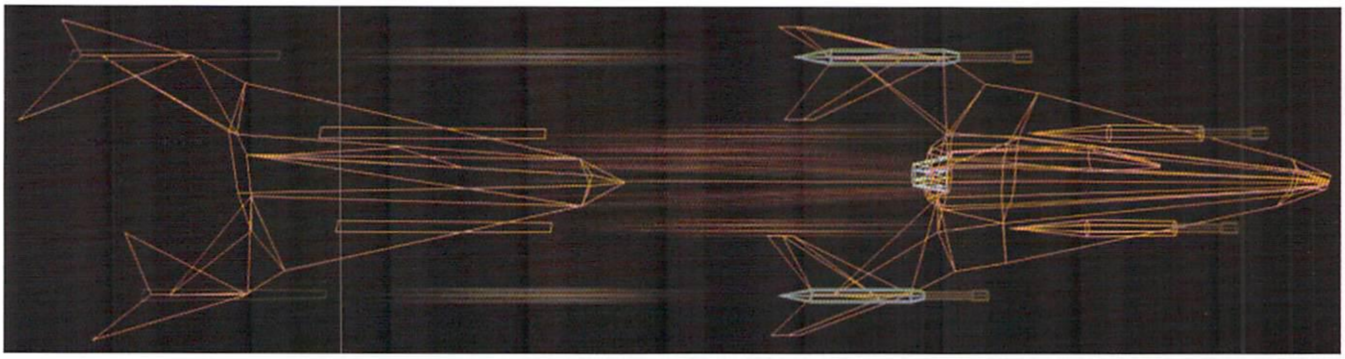
Includes:

- 350+ real world scaled, textured, historically accurate models.
- Over 150 24-bit image maps for added realism.
- Dozens of Load & Render scenes, like Chapel, Great Hall, Storage, Blacksmith, Royal Apartments, Towers & Prison Tower.
- Complete lighting with animated torches and fireplaces.
- Animated Flags and Tapestries.
- All Doors open and close.
- All object hierarchies are intact.

Everything needed to bring the Dark Ages to life!

Polygon Reduction
Part Two

By Jason Booth



Last issue, we reduced the polygon count of the space fighter object included with LightWave down to 564 polygons. This month we'll convert it's current surfacing to something that will work with a game engine, and create multiple Levels of Detail (LODs).

Before we begin creating lower detail versions of our model, we need to decide how we'll be handling the models textures. The original version of this object uses mostly secularity and diffuse maps, which are not allowable in most real-time engines. Therefor, our first step will be to convert these surfaces into a format which our engine will support. We want to use as few textures as possible in order to keep memory usage down, and we also want to be able to use the same texture maps for each LOD that we create. How we apply these texture maps to the main model will often change how we do our LOD's.

Step I

We begin by breaking the model into it's core components : The body, guns, wing-fins, and hatch. Save out each of these sections as a separate object (or load them from the companion CD). What we're going to do is to render each of these components, and turn these renderings into image maps which we can map onto our game-ready models.

Load the body into layout, move the camera a few hundred meters above the object, and set the camera target so that it always faces the body. Move the light into the same position, and target it to the object as well. The object should appear quite small, so adjust the camera zoom factor until the model fills most of the screen - this will eliminate any perspective from our image map. Repeat the same procedure from behind the object - we'll use this render to map onto the engine. Next, load the tail-fins and one of the guns and repeat the process. (I've provided all of these scene files, as well as their rendered output on the CD) What you should end up with is a series of images which looks something like Figure 1.

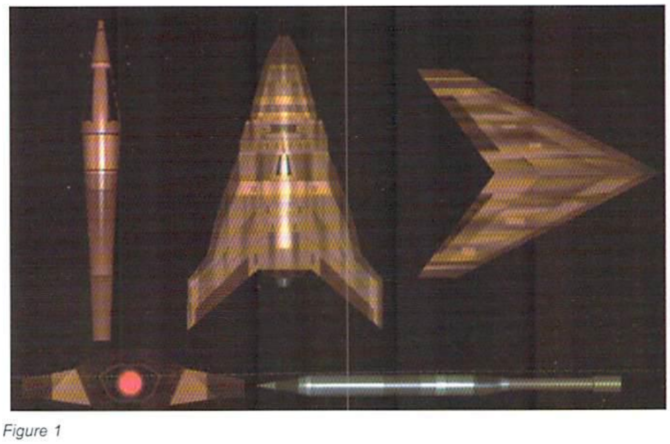


Figure 1

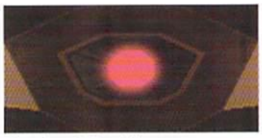
Notice that each of these images is symmetrical down one axis - this can save us a lot of memory at the cost of a few polygons. Instead of using the entire body image map, why not just use one half of it and mirror it for the other side? To do this in LightWave, just make the texture size negative and the image map will be flipped across that axis! We can do the same thing for the fins and save even more memory!

Load up the images you've rendered into your favorite image editing program and crop them so there's no border around them. Next, scale them to an appropriate size for your game engine. This size varies greatly depending on what type of system your working with. However, many systems require textures to be powers of 2, and I have scaled mine down accordingly (see below).

Using the Photoshop smudge tool, I've pulled out the edges on all the images. This will prevent a black line from appearing on the edge of your model if the texture map does not fit perfectly. I've also taken the

Body 256x128

Guns 128x32



Engine 128x64

Hatch 128x32

Tail-Fin 128x64

rendering of the gun and smeared it vertically, so that it can be wrapped around the guns, instead of planar mapped like the rest of the ship. Finally, I ran each image through Photoshop's Blur filter.

Step II

In order for the mirror image trick to work, the space fighter will have to be symmetrical in it's geometry. Load the object into Modeler, cut the guns, tail-fins, engine, and pilot hatch out and paste them into an empty layer. We need to split the body down the Z axis so the left and right sides are mirrors of each other. Create a large box, and boolean subtract the right side of the ship from the left. Clean up any unwanted polygons created by the boolean, then mirror the object along the Z axis. Merge the points and you'll have the exact same space fighter, with a split down the center of the body.

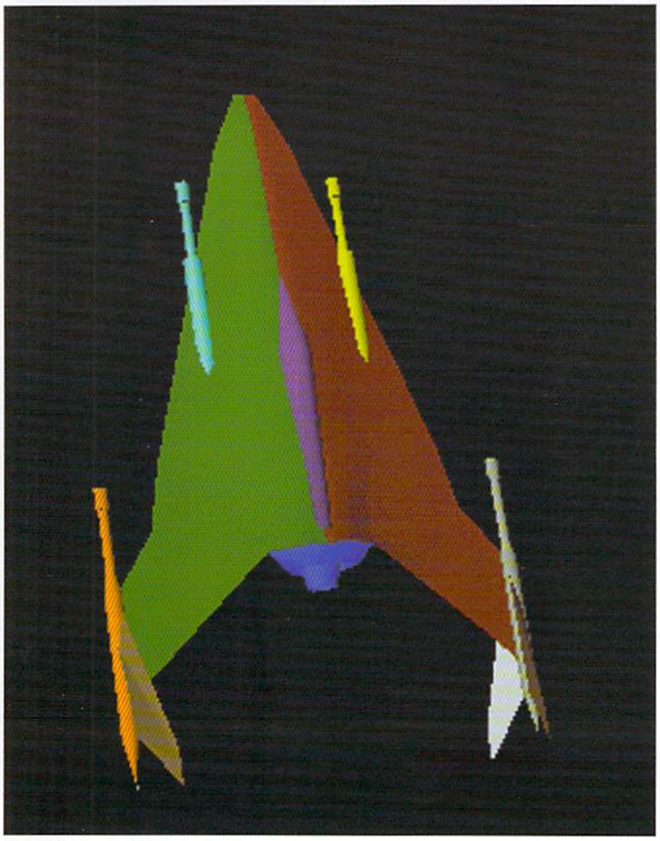


Figure 2

Next, set up the surfaces according to the colors above (Figure 2).

Notice that each gun gets it's own surface, as well as each side of the body and each tail-fin's upper and lower halves. Once in layout, autosize the appropriate texture onto each surface using a planar map for everything. On the right half of the body edit the texture size and make the value negative on the X axis. Also make the texture size negative on the bottom half of the tail-fins, but this time on the Y axis. Now render your image on a white background, with ambiance at 100% from several angles and make sure there are no errors. If you see any black edges against the white background, you'll need to go into a paint program and smear the edge out of the image map some more. If all goes well, you should have a nicely surfaced space fighter, ready to go into a game engine (figure 3).

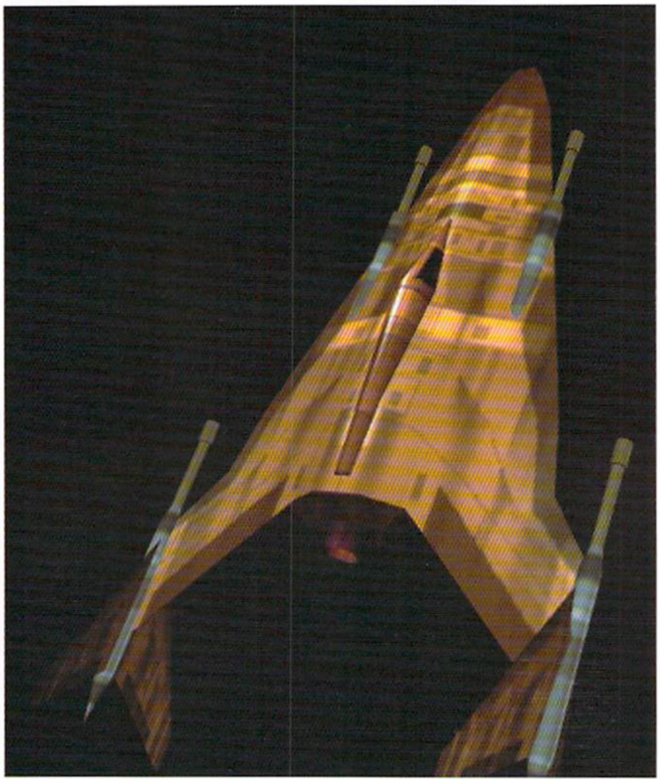


Figure 3 - Our finished object, with our new texture maps applied.

LODs

Rather than give another step by step tutorial, like last months, I'm going to talk about the order and type of reductions which I prefer to do. In LOD rendering, it is important to minimize the visual difference between each level so the viewer does not notice the switch of the objects. In military simulations, objects are usually morphed from one version to the next over several frames so the user does not notice. In game engines, this isn't practical, so we're often left with a popping effect as the object suddenly changes detail levels. Although this looks bad, and we want to avoid this popping effect if possible, it is acceptable in most cases as the viewer is often too busy playing the game to even notice.

"Now this is where we really start hacking at the object"

To help avoid popping, I usually create my first LOD at a level which could serve as the main model. Subtle details, which are nice, but not crucial are removed. The gun turrets are my first optimization. Although having 8 sides provides a very nice, round gun - we could get away with 4, and maintain the smoothness. To do this, I made the bottom of the gun turret much wider than the top. Since the turret intersects with the body, you will not see the bottom of the turret often. This way, we still have a smooth looking object, but only in 4 sides. The next step is to get rid of the lip at the tip of the gun. Although this edge is important close up, it's hardly noticeable far away. Thickness has been removed from the wing fins, saving a few more polygons (Figure 4).

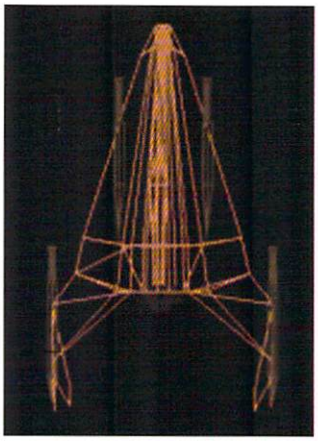


Figure 4. 188 Points, 315 triangles.
58 % 54%

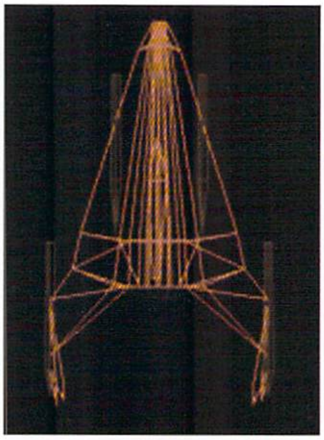


Figure 5. 116 Points, 185 triangles.
36 % 32%

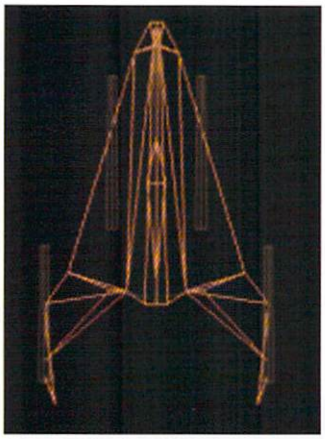


Figure 6. 60 Points, 80 triangles.
18 % 13%

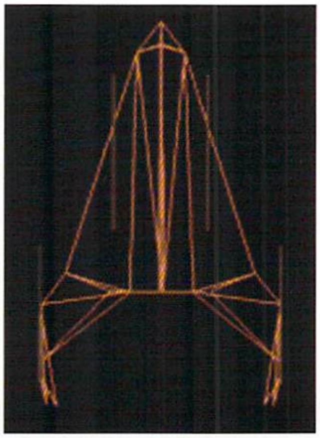


Figure 7. 44 Points, 43 triangles.
13 % 7%

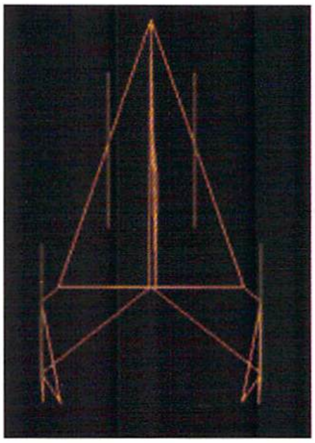


Figure 8. 32 Points, 23 triangles.
10 % 4%

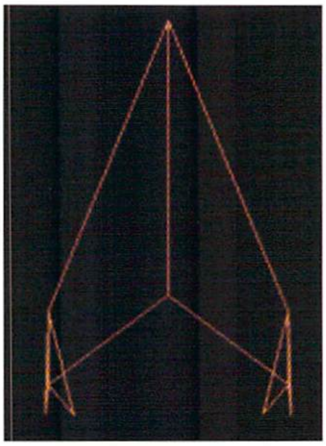


Figure 9. 10 Points, 8 triangles.
3% 1%

For the next LOD, I reduce the guns to only 3 sides, and reduce the number of segments. The exhaust is practically removed all together. Since the exhaust port didn't add to the profile of the ship, it can be replaced with a texture map at this level. There's no reason to keep something 3d in a distant LOD unless it adds to the profile of the object. Maintaining the profile is very important! (Figure 5)

By the third object, the guns are only 5 polygons each, a simple extruded triangle. The body has been reduced using last month's techniques, yet the basic profile remains the same.

For the fourth object, the body is simplified even more - I also replaced the guns with single, four point polygons. At extreme distances, you won't notice.

Now this is where we really start hacking at the object. The main section is still 3d, but the bottom half leading to the wings is completely flat. The tail-fins will cover any errors this creates from the side. The engine area now spans the width of the body, and the engine map stipples across the back. A quick autosize on the surface will fix that.

The final version is just 8 triangles! (figure 9). You might even want to go further, and do a 2 triangle aproximation of the body.

Each of these objects were created in a single pass, reducing the geometry from the last model and comparing it's shape against the original model.

As usual, you'll find all of the models and images created for this article on the CD. Also included is a script I wrote for Bob Hood's BML for Layout plugin. It's an object replacement script which swaps the objects based on thier distance from the camera. I've included an AVI of the space fighter being degraded as it moves away from the camera, as well as the respective JPEG frames for those of you not infected with the Windows virus (does it sonds like Jason dislikes Windows?). The space fighter on the right is the original object, the first degrade happens after the camera moves 5 meters from it's starting point, and then every 15 meters after that until the object is degraded to 8 triangles. These settings could easily be changed at run time based on the frame rates the user is getting, and the importance of the object. If the frame rate is too low, the objects just degrade quicker, keeping the frame rate constant even during complex scenes.

Jason Booth has reinstalled windows 42 times, collects musical instruments, plays too much Diablo, been to 21 Phish concerts, and has 109 stars in Mario64.

CD-ROM

On this issue of the LightWavin' CD-ROM, you'll find all the scene files, objects and images discussed in this article. Also included are many images and a couple animations on the topics discussed.

The most acurate preview

Lightwave's rendered output often looks very different from the way your game engine looks. This is due to the large number of short cuts game engines do in order to keep the frame rate up. There are several things you can do to minimize these differences.

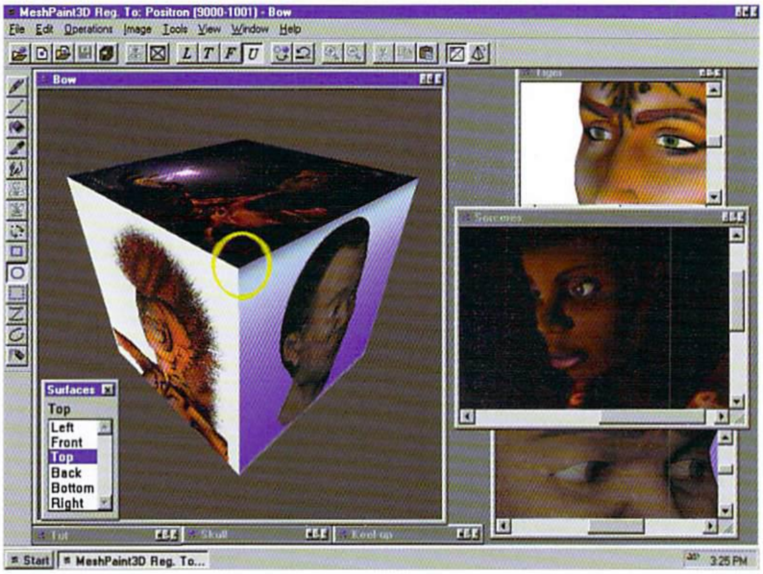
	Pixel Filtering	Antialiased textures	Antialiased Images
Nintendo 64	Yes	No	Yes
Playstation	No	No	No
Saturn	No	No	No
M2 (spec only)	Yes	No	Yes
PC	No(*)	No	No (*)

* A PC with 3d acceleration may have these functions. However, I would suggest not counting on them, since most PC's are not currently equipped with 3d accelerators.

<> Pixel Filtering : This is probably one of the buttons you've never bothered to turn off. Pixel filtering prevents a texture map from pixelating as it gets too close to the camera by blurring the area between two pixels. However, many game engines do not support this, as it takes many calculations per pixel to do.

USE MULTIPLE TEXTURE MAPS FOR YOUR LIGHTWAVE 3D OBJECTS?

YOUR 3D PAINT SOFTWARE SHOULD TOO.


MeshPaint3D Reg. To: Positron [9000-1001] - Bow
File Edit Operations Image Tools View Window Help
Bow
Surfaces
Top
Left
Front
Top
Back
Bottom
Right
Start
MeshPaint3D Reg. To...
3:25 PM

MESHPAINT 3D™

〈 Direct LightWave support so your texture maps end up where they're supposed to.
〈 Faster and less expensive than the competition.
〈 Supports 11 geometry formats in addition to LightWave including 3D Studio MAX and SoftImage NT.
〈 New version 1.6 has 30 new features including tablet support, faster painting, and new paint tools.
〈 Loads large models with tens of thousands of polygons without crashing.
〈 Available for over two years and has the stability to show it.

Get a free demo at: www.3dgraphics.com or call
800-365-1002 or 402-330-7011.
Also available from Lightspeed 800-764-8696.

CGW EDITORS' CHOICE AWARD COMPUTER GRAPHICS WORLD

PCG&V '95 HIGHLY RECOMMENDED PC GRAPH

POSITRON

GETTING DOWN TO BUSINESS

by Tom Rennen

For those of you who have not yet heard of Intelligent Light, I'll give you the 2 cent tour. Intelligent Light began about 6 years ago with one person (myself) and a couple of Amiga 2000 computers with Video Toaster cards. With some determination and fear of starvation, I ventured out into the world of the self employed. I did make mistakes but lady luck was on my side and saved me from what at many times seemed to be certain death. We are now doing work for companies such as Barney, JC Penney, ABC Sports and others.

I did however, keep a sort of diary of my travels through the business maze. I felt compelled to share this with others and perhaps save some of you the problems that I encountered while trying to make my little place in the world. So, here we are, ready to take on the stupid notion that you must work for someone else so you can make them money while you get canned 3 or 4 years later due to cut backs or because the owner wants to hire his nephew.

Starting your own business can be a frightening experience. The fear of the unknown, the fear of failure, and the worst fear of all… the fear of FEAR! Well, I'm here to tell you that fear is the dream killer! Many a dream have been quelled without so much as a chance to leave the starting gate. Will you later say to yourself, "If I only would have...". Regret is, in my opinion, worse than failure. Failure, on the other hand, is just an incomplete journey due to a wrong turn. It doesn't mean you're not still on your way. It simply means you need to take another road to get you to where you're going.

The first thing to remember when beginning your own business is that you are in the business of providing value to your customers. No matter what area of business you're in, this rule always applies. Financial compensation is a direct result of this way of thinking. People don't mind paying for what they want or need. They do however, want to feel that they are getting more than what they are paying for. We all do. That's value!

The next thing to consider are the markets. Sell your services to people who will buy them. Not everyone can afford or needs a 'Network wiz-bang product'. This is where the small startup company can fit the bill. There are many more people wanting but unable to afford high end work than there are people who can. Pick markets to sell your services to based on your current ability. As you add resources, and your ability to produce better work increases, go after better paying markets. It would be very bad for you to put substandard work in front of a customer who is expecting better. You may one day end up bidding on a job from that very customer and he remembers the poor quality reel you sent him and passes you over, even though you can produce for him.

As crazy as this sounds, I just have to say it. The reason most people fail at starting their own business is because they decide not to start one in the first place. They kill their dream by doing nothing. I am no different than any of you. If I can do this, anyone can! I'm the most unorganized person I know. I just decided that I was more afraid of doing nothing than I was of failing. Take that first step! You'll be surprised at how quickly you can walk.

With that out of the way, lets get to your first lesson. The most frequently asked question of me is "How do you know what to charge?" Well, the answer is simple. You first need to determine what it costs you to run your business. Here is a simple breakdown to figure it out. Add up the replacement cost of *all* your gear for the next 3 years. Take the total you come up with and divide it by 36. The 36 figure represents a 3 year period (36 months). Now take that figure and divide it by 175 which will be the average number of hours in the month that you will work. The number you come up with is the hourly rate you need to charge 8 hours a day, 5 days a week to pay for all of your equipment in 3 years. Now this just covers your equipment. You still have other bills, but that comes later.

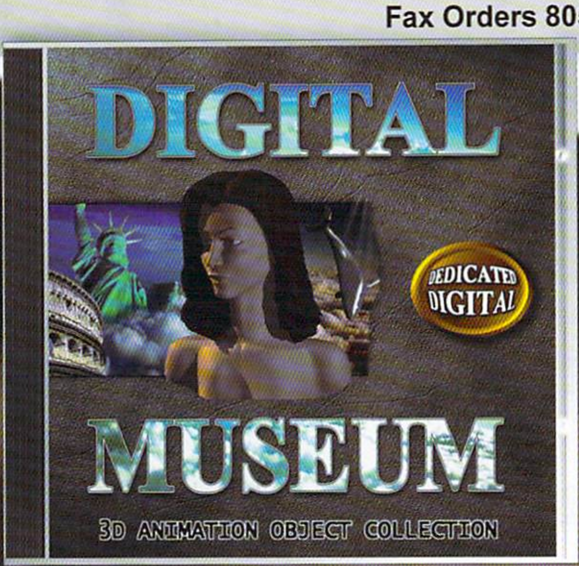
Now, I know many of you won't be able to bill a job for a full 5 days per week in order to get your money back for your equipment, especially if you're just starting out. It will even out though, and here's how. After you create a scene to render, your computer will take over the work as it creates the frames. This will more than likely take place while you're snug in your bed counting Raptor workstations. Take the total time of the render and bill your rate for that time as well. This will make up for those working hours in the week where you're doing nothing

Yes, you get paid to sleep! Glory, there is a God in Heaven!! Now, this amount you bill only covers the cost of your gear. After you've come up with the hourly rate to cover your gear, don't forget to add what you want to make yourself as profit! If the hourly rate is $20.00 an hour for your gear, add another $15.00 to it, or whatever you feel your time is worth. Adding these two hourly rates together now come to $35.00 an hour for everything you do. DON'T EVER GO UNDER IT!

Next time we'll cover your monthly expenses, rent, phone, electricity, etc. Well, that does it for this time. I wish all of you the very best and here's to all the success you deserve!

Tom Rennen is the owner of Intelligent Light and the producer of the 'Starting Your Own Animation Business' video. He can be reached via e-mail at: ianim8@airmail.net

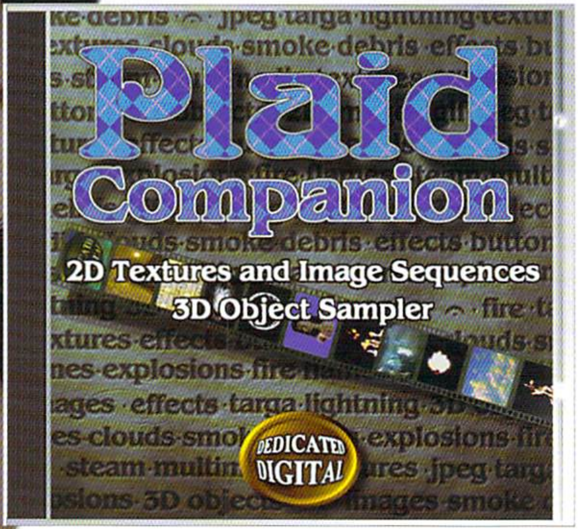
Credit Card Orders US call 800-764-8696 , All Other Orders 805-726-3545
Fax Orders 805-726-3544 , Info 770-795-0351


DIGITAL
MUSEUM
3D ANIMATION OBJECT COLLECTION
DEDICATED DIGITAL

Digital Museum - only $129.00

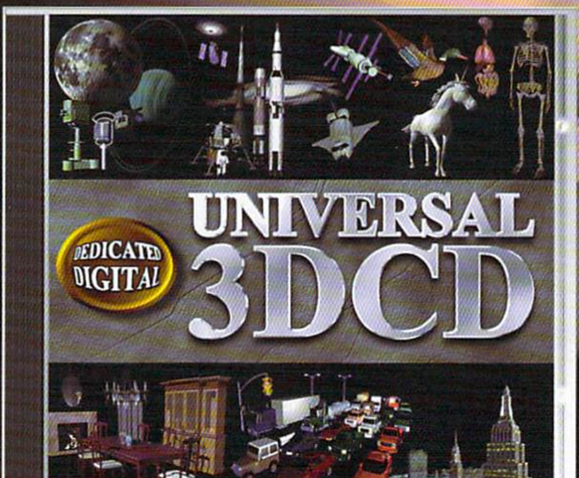
Lions, and Tigers, and Bears...

and Aliens, and Roman Soldiers, and the Chrysler Building. Zeppelins, Manatees, Gargoyles, and Motorcycles. The Spanish Armada. Elephants, Tables and Chairs, a TV camera, Uranus, interesting Design Elements, exciting Textures, solid and jointed People, and a T-Rex.


Plaid
Companion
2D Textures and Image Sequences
3D Object Sampler
DEDICATED DIGITAL

Plaid Companion - only $24.00

Universal 3DCD - only $129.00


UNIVERSAL
3DCD
DEDICATED DIGITAL

All of that PLUS much, much more.

Three CD's

packed with SUPER MODELS and SUPERIOR CONTENT.

Excellent for Animations, Game Creation,MultiMedia, and Illustration. In Lightwave 3D, DXF, and 3Dstudio/Max formats.

Digital Content for your next project.

DEDICATED DIGITAL

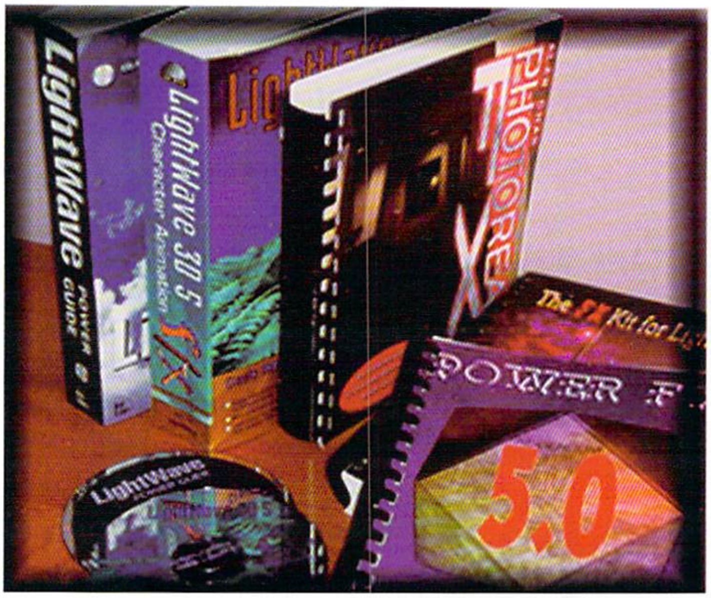
Check our web site for a list of CONTENTS and complete DETAILS

www.mindspring.com/~bcapozzi/ddi.html

PRODUCT REVIEW

Browsin' The LightWave Library

By Steve Bowie



As NewTek programmers have responded to 'high end' market demands (and their own groundbreaking notions), our favorite 3D program's power has become awesome. Though LightWave's user-friendliness is legendary, there is a small downside to this maturity - it now takes longer to plumb LightWave's depths.

LightWave offers multiple solutions for any animating task - one approach may be a favorite, but at times another may be 'smarter'! Keeping up with the possibilities, exploring new ones, remembering various work-arounds and inventing new ones is a wonderful quest! Yet, for seasoned pro and 'newbie' alike, it can be a daunting task. Even with a good interface, it seems the more powerful the program, the steeper the learning curve.

We all know that the stereotypical 'Real Digital Man' never cracks a book. Oh no, he just jumps in and blunders his way to success. If this works for you, fine; active, 'hands-on' leaning is essential! If however, you want to reduce the length of time you spend stumbling along the path to success, you'll likely invest in some tutorial materials. There are quite a few videos available, and (finally!) some really fine LightWave books are appearing. One benefit of print (beyond being able to take it into the "reading room") is its 'nonlinear' nature. No fast forward needed - just skip around!

So, for those of you who want to move beyond playing with menu options (and for those who want to see how someone else does it), we present this thumbnail look at the current offerings with one proviso. The value to you of any of these publications, and possibly your enjoyment of them, may vary from mine. This should be obvious. Your appreciation of a road trip depends on the time available, the starting point, whether you've traveled the route before and your personal preferences in scenery and traveling companions. To set my remarks in context for you, I consider myself a 'chronic intermediate' LW user - lots yet to learn, the basics pretty well in hand, never enough time.

[The 'Kosh' Trilogy]

First on my list are the volumes I call the "Alan Chan Trilogy": the original "FX Kit for LightWave," its sibling, "Power FX - the 5.0 addendum," and the newest member of the family, "Photoreal FX". I confess. I really like these books. I've learned a lot from them, without really working at it. Due to his penchant for brevity, Alan Chan is often jokingly referred to online as Kosh, after Babylon 5's silent Vorlon. He writes with a clarity and simplicity seldom found in technical publications. Reading his books is so easy, I have a hard time putting them down.

The FX Kit for LightWave

LightWave is sometimes described as a program with a terrific modeler and great rendering, but also a few awkward gaps in animation controls. Plenty of tricks and work-arounds exist to make up for these shortcomings, though. Knowing them lets power users 'fake' many of the features of programs costing much, much more. The eleven chapters in this 300+ page spiral bound book (it lies flat on your desk) not only cover the basics, but introduce many exotic concepts familiar only to LightWave cognoscenti.

The first chapters cover LightWave fundamentals - like navigating within Modeler and Layout - and Chan soon gets to his real strength, tutorials. First though, there's a little side trip. Chapter 4 is entitled 'Troubleshooting.' Here we're warned of more than 30 common pitfalls that await the unwary apprentice 'Waver.' Chan cautions "the time will eventually come when you are confronted by this problem. Diagnosing the solution becomes easier because you've already read about it, and half the solution is already floating in the back of your mind." Works for me!

[Surface Sense]

Chapter 5 provides a great tour of one of my favorite LW pastimes, surfacing. Key to mimicking nature (or inventing unreality) and creating 'believable' objects, surface creation is an art in itself. Sure, the current 'improved' LW manuals cover these things, but the FX Kit's lessons supply quick and easy real-CGI-world examples.

They give a much better sense of really working with LightWave's tools, making the whole process less intimidating.

The FX Kit is laced with tutorials - actually, it is mostly tutorials! Each of them teaches concepts you'll use over and over as your skills grow. Where possible, each tutorial builds on its predecessor. First lakes, then a cloud-diffused sunset enhance the mountainscape created in Chapter 7, 'Imitating Nature' (for those bored with mere intergalactic challenges).

If you're NOT yawning at the thought of the next space epic, the Section entitled 'Space Effects' will train you to design and build your very own space fighter. Model it, paint it, turn on the lights...go ahead, put a few dents in it while you earn your wings. In time you'll be firing up the lasers, and lording it over your own solar system.

Sections on lighting, bones and kinematics round out the tutorial information. Chapter 11, entitled 'Compositing and Photorealism' dispels the mysteries of foreground, background and alpha images.

PowerFX: The 5.0 Addendum

The 'FX Kit' is a great book, especially for LightWave 'newbies.' However, shortly after its printing, NewTek sprang the surprise version 5.0 upgrade of LightWave. Answering the challenge, the FX Kit publishers soon released a new volume, the Power FX: 5.0 Addendum. Initially, their intention was to provide an 80-90 page 'snap-in' addition to the original volume. By the time they'd covered LW5's new features however, the 'addendum' had become a work in its own right - nearly twice as long as planned. So the Power FX book does not cover the same ground again. It really supplements the original FX Kit.

Beginning with an overview of the new features, Chan illustrates how many of them can be used in practical ways. For example, he uses LW5's new ability to add multiple layers of textures to apply 'laser burns' across the fuselage of the spacecraft created in the previous volume. Then Chan takes a side trip into Adobe Photoshop to illustrate image map creation. Elsewhere, he exploits a great feature in the LW5 Lights Menu - the ability to make a light project an image onto a surface. Power FX tells us how to use this ability to create 'cookies' (cutout shapes used in the real cinematic world to fake natural shadows).

Other enhancements of LW5.0 are Metamation, which somewhat simplifies character animation, MetaNURBS and Metaballs. Power FX tutorials quickly familiarize readers with the new features. The book spends nearly forty pages, though, on the powerful MetaNURBS modeling tool since that one requires somewhat different techniques (the Bevel tool is your friend!). Power FX also covers changes in the use of Inverse Kinematics and Bones.

Photoreal FX

The most recent addition to the trilogy takes a different tack than its predecessors. In this volume, Chan briefly reviews the basics, but assumes that you are already comfortable with them. Concepts previously learned layer upon one another like the component attributes of a Surface; each element adds its subtle aspect to the sum. Pirates, don't buy this book (don't steal it either)! 'Photoreal' might be likened to a pleasant, informative day spent with a gifted CGI journeyman.

[But Is It Art?]

'Photoreal' leads off with a segment on 'Art Design.' If you have a photography background, most of this will be familiar stuff.

If not, you'll benefit from this general discussion of the use of good composition, eye-line, focal lengths, color and lighting for various dramatic purposes.

The next segment appears at a glance like a quick pan through the basics of modeling, surfacing and lighting - and so it is. This refresher mainly touches on common problems (dealing with non-planars for example) and culminates with an example of lighting a virtual set to match real world composited elements.

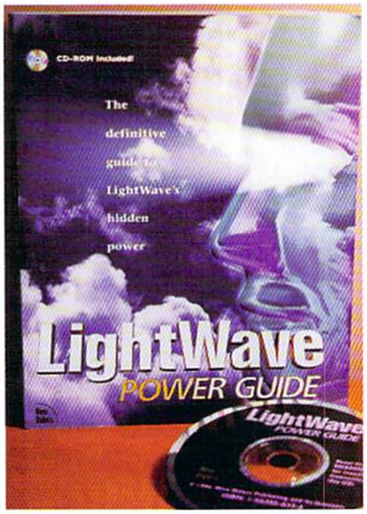
The chapter headed 'Animatics' holds an interesting exploration on 'point of view,' as well as a 'bouncing block' tutorial that provides a little practice in the use of spline controls to mimic natural dynamics.

The last chapter begins with a glance at third party plug-ins, Particle Storm and Sparks. It moves through the topic of lens flares, and on to a subject dear to the hearts of most LightWavers - the chance to blow something up! The grand finale tutorial is over 40 pages dedicated to the creation of a realistic, spectacular and suitably messy space catastrophe!

This latest member of the FX kit family is not an in-depth look at LightWave's tools. It will not take a 'newbie' from 0-60 in 291 pages. However, if you have already read the previous two books in the series, or even thoroughly studied the manuals that came with LightWave (and practiced the tutorials in them!), Photoreal FX can improve your comprehension of, and comfort with, the software. It is a useful and enjoyable addition to the 'LightWave library' for the intermediate user.

The LightWave POWER GUIDE

The LightWave POWER GUIDE, by well-known 'Waver' Dan Ablan, is something of a breakthrough. It's the first LightWave book to hit the mainstream, appearing on bookstore shelves in several countries. At 552 pages plus a hefty index, the POWER GUIDE is a weighty and comprehensive volume. It even includes a CD ROM with roughly 160 megs of project files (including a pretty decent 'Man.lwo') used in the various tutorials. You'll also find demos of some third party products here, including VertiLectric, Sparks, Particle Storm, MeshPaint 3D and The Professional Web Design Kit (new from New Riders). The CD also contains a 'gallery' and miscellaneous utilities including a Web directory.



After an introductory chapter, the POWER GUIDE launches into a browse of the functions new to version 5.0 - MetaNURBS, OpenGL, MTSE (Multiple Target Single Envelope) morphing and other improvements to the tools of Modeler and Layout. Following this, the book takes a closer look at LW's two main components.

Ablan dedicates just over 60 pages to Modeler. His 'mini-tutorials' may give you a better idea of just how easily common tools can yield impressive looking objects. This may be familiar ground, however, to anyone who has been using LW for a while.

The Layout tour is next; and your guide, Mr. Ablan, takes you into lots of little nooks and crannies not on the usual whirlwind itinerary. He covers lesser known functions like 'Object Replacement,' shader plug-ins, the use of 'Lazy Points' and Effectors as well as the more familiar landmarks (can you say 'lens flares'?) like Fog and DOF. Chapter Five guides you through using basic modeling and layout skills to create a simple animation. It concludes with a brief look at some third party plug-ins (VertiLectric and Wave Filter).

[Up With Carbohydrates]

At this point we're nearly halfway through the POWER GUIDE, and about to begin what I think is the best part, the tutorials. They occupy three 40-50 page segments, broken down into introductory, intermediate, and advanced levels.

The tutorials are easy to follow and all quite useful - even the first (and presumably simplest) exercise which involves tracing a client's scanned logo to create a great looking object. Also here is the apparently unavoidable side trip into Photoshop to create brick image maps (c'mon guys, let's make building materials for the other two little pigs next time!) and an opportunity to 'Boolean' that 20 inch monitor you've been wanting to buy.

Next stop is the kitchen! If, like mine, the pinnacle of your culinary skills is microwaved popcorn, the least you can do is learn to boil virtual water or fry up a sizzling panful of virtual bacon. Alban brings together realistic surfacing, morphs, particles and bump maps to create believable food scenes. If you can render this tutorial without a trip to the 'fridge you're a better man than I!

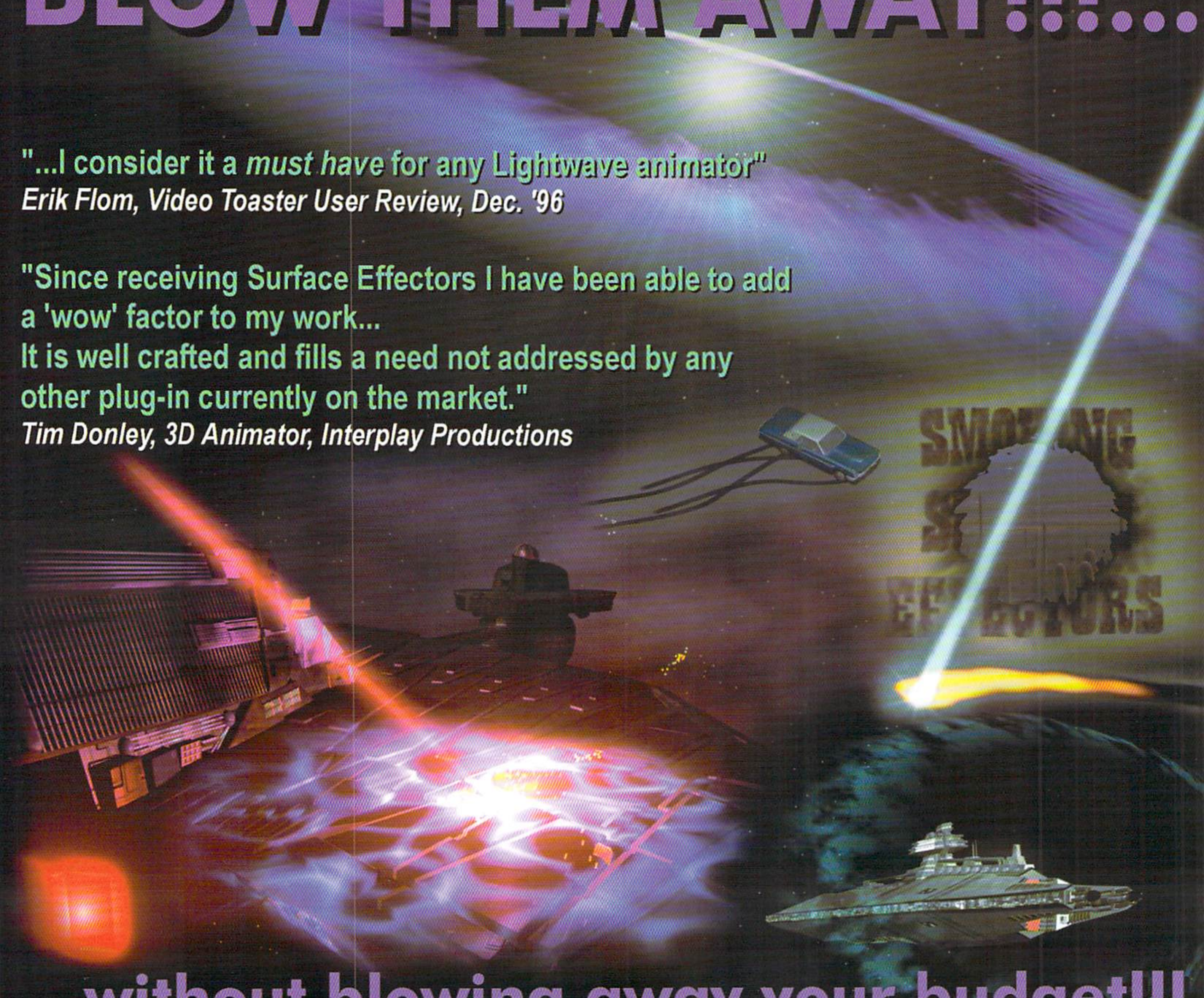
[Taming the Twister!]

In the advanced section, you will model a skyscraper, plunk it down in Chicago's waterfront, then 'walk' it offscreen (doubtless much to the surprise of pedestrians and passersby). Issues related to photorealistic compositing come into play here, as they do in the following tutorial which has you placing a virtual phone on Dan's desktop. The favorite exercise of all readers will certainly be the next one though, especially after the success of the recent adventure movie Twister! The seriously impressive 3D tornado it helps you make will do a lot more than send you looking for your insurance policy. This lesson is not one to skip!

A substantial character animation chapter follows. Here, the basics of object 'emboning' (you're right, I made that word up, but it's better than the alternative!) lead to the creation of an animated figure named 'Cecil'. Cecil in turn falls victim to our excesses as we twist and turn him, add facial features and learn how to use these to convey emotion. Relatively easy methods of blinking, eye and eyebrow movement and so on combine with 'mouth-morphing' and lip synch to create a very entertaining little fellow.

Sooner or later all freelancers are bound to be asked to animate the obligatory 'walking phone' (or toothpaste tube, shaver, or what have you). Before you leave this section, you'll

BLOW THEM AWAY!!!...



"...I consider it a *must have* for any Lightwave animator"
Erik Flom, Video Toaster User Review, Dec. '96

"Since receiving Surface Effectors I have been able to add a 'wow' factor to my work...
It is well crafted and fills a need not addressed by any other plug-in currently on the market."
Tim Donley, 3D Animator, Interplay Productions

...without blowing away your budget!!!

with

SURFACE EFFECTORS/DSFX 1.1

For Only $99.95

Have you found surfaces in Lightwave limiting? Have you always wished there was a little "E" button next to all those fields on the Surfaces Panel? Well, despair no longer...Surface Effectors/DSFX is a powerful plugin that **unleashes your surfaces** in Lightwave, allowing you to achieve dynamic surfacing effects in record time without resorting to complex image mapping sequences. Use animated nulls (called Surface Effectors) to **envelope your surfaces'** color, diffuse level, luminosity, specularity, reflectivity, transparency, edge opacity and index of refraction; control surface color using the HLS color model, allowing for **unique "colorizing" effects**; restrict the effect to a localized area with **fully animateable inner and outer effect radii**; group Surface Effectors together and control them all with a few mouse- clicks; modulate the effect with a **dynamic, fully animateable fractal noise** (including a time-turbulent variant that does great smoke/vapor effects); **leave animated trails with variable decay** behind your Surface Effectors as they whiz around your scene (this does great **laser burn-aways, auto skid marks, rocket trails**, etc.); use a special "ripple mode" to create **dynamic shockwave and ripple effects**; save time and money; impress your co-workers; dazzle your friends; and, above all, **blow your clients away** with the remarkable effects that you can do...just be sure not to tell them how easy and fun it was using SE/DSFX, or they might not want to pay you...

"Phaser firing on Klingon cruiser" image courtesy Michael Sherak, Interplay Productions...look for it in Interplay's hit game "Starfleet Academy"

To purchase SE/DSFX, contact your local dealer or call Prem Subrahmanyam Graphic Design at (904) 575-6051 (M-F 10AM-6PM EST) or visit the SE/DSFX homepage (and pick up a free demo) at: http://www.noblestar.net/~prems/ppp.html

ALSO AVAILABLE AT LIGHTSPEED - 800-764-8696 (US) 805-726-3545 (outside US)

learn to mobilize the phone you modeled in the previous chapter.

[Wrapping It Up]

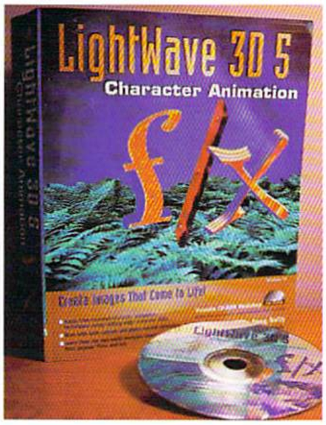
POWER GUIDE also covers third party plug-ins, including Mesh Paint, WaveFilter, Sparks, MotionMaster, VertiLectric, VertiSketch, Surface Effectors, Power Macros, MacroForm, Impact and Particle Storm and others before moving on to consider output options for print and video. Chapter Twelve, 'The Business of Animating,' provides practical tips for those considering a freelance animation career. It gives the 'bread and butter' issues of marketing and pricing equal time with other important matters including personal goals and professional pride. Ablan finishes with pointers to additional resources, stressing the importance of keeping current.

The LightWave POWER GUIDE takes a comprehensive look at the program, and is written like the current NewTek manuals, as opposed to the more casual style of the FX series. Some will prefer this, and be pleased to find so much information in one volume. More advanced users may be a bit disappointed to see much of the book dedicated to familiar material (a second volume is currently being prepared to satisfy more experienced 'Wavers). Newer users, however, will find that the POWER GUIDE is a great value and a sure way to build LightWave skills!

LightWave 3D 5 Character Animation

Catchy title, huh? Well, make no mistake, Doug Kelly's new book is exactly what its title proclaims it to be. Nearly every paragraph of this almost 700 page volume focuses on animating characters. It is a monumental piece of work, and a 'must-own' for those who aspire to stardom in this field. Whether you're an experienced 'Waver seeking to extend your skills or a traditional animator seeking to translate your techniques to computerized 3D tools, this book belongs on your bookshelf.

The integration of labor saving computer techniques with laborious, traditional cel animation has been a bumpy process. It has created new jobs and redefined old ones. And it has forced 'geeks' and traditional artists to appreciate each others' abilities and needs, and learn to speak each others' languages. 'Character Animation' helps bridge the two worlds by placing LightWave's toolset in the context of the classical animation industry.



[Your Mission, Should You Choose to Accept it..]

Since the book serves readers with varying animation experience, Chapter 1 is a roadmap, a 'mission briefing.' It gives experienced CGI artists, traditional animators and beginners unique plans of 'attack' on the subject.

Speaking of beginners, as fine a book as this is, it should almost certainly not be the first LW manual you read! Character animation is arguably the most advanced form of LightWave achievement, and the sheer volume of work involved is astounding. While it covers pertinent LightWave functions exhaustively, the book does not explain each menu option in detail. Nor will it show you how to make a sphere or box! Have your basic skills in place before you begin.

[The Animator's Hat]

'Character Animation' (CA for convenience from here on) is divided into three sections. Section One deals specifically with the role of the animator. The first brief chapter introduces the animation team - or, if you wear all the hats yourself, holds up a mirror so you can see roles you'll play: technical director, supervising animator, track analysis specialist, art director and so on. The chapter includes helpful comments about working as a team, knowing when, and when not, to argue, and ergonomic and health issues.

Next up is a look at fundamental animation tools, including object replacement and/or displacement techniques. The uses of Bones and MTSE are here, too. Chapter Four introduces the use of IK tools to control head and eye/eyelid motions. Chapter Five gives detailed instructions for using spline controls and distortions to provide 'squash and stretch,' ease-in and -out and other effects. CA consistently ties LW's functions to their equivalents in classical animation, using traditional terminology wherever possible.

[Care for a Stroll?]

Chapters Six, Seven, and Eight alone would probably be worth the price of this book. I'd love to have a dollar for every animator hour spent tweaking a realistic walk cycle. CA devotes almost one hundred pages of tutorials and discussion to the basic walk, accelerating to a run, stopping and animal gaits, as well as the exaggerated 'sneak' (slow and fast), double-take and stagger. The next two chapters review industry practice and terminology in matters of camera angle and movement, lens focal length and posing and 'acting' techniques.

Chapter Eleven closes Section One with a consideration of facial animation, focusing primarily on lip sync issues and illustrating the use of image maps, bones, MTSE or a combination of these.

[The Neck Bone's Connected to the...]

Through Section One CA focuses largely on 'layout issues' like timing, motion, camera use and so on. Section Two, 'The Technical Director,' is more of a nuts and bolts discussion of modeling. The TD must have a keen eye for the use of bones and other manipulative structures to provide everything the animator needs to bring his creation to life. 'Advanced Modeling for Character Design' and 'Advanced Modeling for Character Faces' comprise 90 pages of detailed examination of these subjects. Bone placement and parameters for point-precise control receive a great deal of attention here. This is followed by tips for the creation and application of image maps and shaders to your characters. Section Two ends by considering default scenes, backdrops, lighting design and rendering tips.

The third section of CA, while the shortest, is nonetheless of great interest, especially to those coming to the realm of 3D animation from a computer background. Chapter Nineteen offers easy to understand insight into the animation production environment. It illustrates terminology, storyboard, layouts, and bar and exposure sheets with real world examples. Finally, Chapter Twenty ties up loose ends, discussing issues of compositing, titling and output, along with some valid pointers to assist you in completing a dynamic demo tape. Over 150 pages of appendices, glossary, and index provide useful references, including an introduction to the Track Analysis software, Magpie, a demo version of which is on the included CD. Oh, by the way, this is the only one of these books to include a color section!

LightWave 3D 5 Character Animation is a remarkable work. And since it is written from a classical perspective, it will retain its value as new releases of LightWave appear. Again a caution, though, CA should not be your first or only LW book. If you plan to limit your work to a different niche (say architectural work), the book will have only limited value to you, although you may look long and hard before finding more useful information on composition. Everyone else should invest in this book. Even those already at the zenith of their art are likely to enjoy it.

[The Overview]

Five books, three authors, three distinct styles - scores of tutorials, hundreds of subjects, thousands of tips - who can complain? The LightWave library is growing, and we are the real winners. Alan Chan's 'FX' books are easy reads that will soon have you feeling at home with your more experienced colleagues. Dan Ablan's LightWave POWER GUIDE provides comprehensive basic to advanced-intermediate coverage in one volume. Doug Kelly's new 'Character Animation' volume is bound to become a classic in the crossover terrain between digital and traditional animation. There's something here for everyone from 'newbie' to veteran. Never has the LightWave community been so well served in print. Crack a book and celebrate!

All 5 books: The FX Kit for LightWave, Power FX 5.0, PhotoReal FX, LightWave Power Guide and LightWave 5 Character Animation F/X are all available from:
Lightspeed
2763 West Avenue L Suite 172
Lancaster, CA. 93536
800-764-8696 (US Only) 805-726-3545 (All Orders)

The LightWave Power Guide is availabe from:
New Riders Publishing
201 West 103rd St
Indianapolis, IN. 46290
800-428-5331

The LightWave 5.0 Character Animation F/X book is available from:
Ventana Publishing
800-743-5369

CD-ROM

This months's CD-ROM contains objects, scene files and othe items from the reviewed books.

LIGHTWAVE 3D

HANDS-ON

Training Workshops

in the Washburn University/NewTek Technology Center

LightWave 3D Essentials

April 18-20, 1997

August 18-19, 1997

October 10-12, 1997

Advanced LightWave Techniques

June 20-22, 1997

August 20-21, 1997

October 13-14, 1997

Organic Modeling and Character Animation

August 22-23, 1997

Video Toaster and Flyer workshops
also offered throughout the year.

www.wuacc.edu/ce/toaster.html

Washburn University/Division of Continuing Education
1700 SW College Avenue, Topeka, KS 66621 USA
(913) 231-1010, ext. 1399 • Fax (913) 231-1027
E-mail: zzdpce@acc.wuacc.edu

LIGHTWAVE - INTEL, POWER MAC, DEC, AMIGA, & SGI!

MONITORS - VIDEO CARDS - TBC - GENLOCKS

VIDEO & ANIMATION HQ

Authorized Amiga Service Center

Complete Video Toaster / Flyer System. Ready to Go!

Hardware & Software:

Phase V Graphic Cards, Accelerators
DPS Peripherals, LightWare 5.0, Intel,
Power Mac, DecAlpha, LW plug-ins
LW Tutorials, Multimedia Displays
Villagetronic products, SuperGen SX Bundle
SUPRA Modems, Internet Software

CALL: (619) 589-9455 FAX (619) 589-5230
The Lively Compter, 8314 Parkway Dr., La Mesa, CA 91942
tlively@connectnet.com or http://www.iworks.com/tlc/

HARDWARE - REPAIR - UPGRADES - MODEMS

DIGITAL A/V EDITING SYSTEMS MULTIMEDIA - NETWORKING

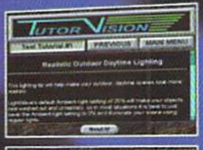
TUTOR VISION 3-D CD

Interactive, Multimedia
CD-Rom for LightWave3D

The FASTEST and EASIEST
way to learn LightWave3D!

Each volume contains the following:

Video Tutorials
At least 6 different video tutorials!
More than 3 hours of detailed video
instructions with audio narration!



Text Tutorials
At least 6 different Text tutorials!
With accompanying screenshots
and optional audio narration!

News, Reviews, & Interviews
Industry News! Reviews of new
and popular LightWave products!
Interviews with other 3D animators!

Product Showcase
Detailed information about
new and popular products!
All compatible with LightWave3D!

Animators Showcase
Dozens of sample pieces of work from other
LightWave animators! Includes contact info
and comments from the artists themselves!

Objects & Images
A dozen 3D objects!
A dozen image/texture maps!
All LightWave compatible!

Recommended system configuration:
PC version: Pentium, 16mb RAM, 4x CD-Rom, audio card, Win95/NT
DEC Alpha version: FX!32, 16mb RAM, 4x CD-Rom, audio card, WinNT
Amiga and Macintosh versions: Coming Soon!

Volume 1
available now for only:
$69.95

Event Horizon Studios
Phone: (518) 756-6850
FAX: (518) 756-6836
Web Site: www.tv3d.com

CHARACTER SHOP

BY DOUG KELLY

Welcome to the shop! In this column, I'll bring you tips, tricks and tutorials on character animation using LightWave 3D. I'll cover any topic that's character-related, and I'd like to hear your questions and suggestions. You can contact me c/o Lightwavin', or email kcc@apk.net.

Let's start with a tutorial on one of the most popular character animation topics, lip sync. I'll cover the basics of vocal track analysis, using Magpie software to make track analysis easier and applying Magpie's output directly to LightWave character animation. Along the way, I'll discuss character animation tools useful for lip sync: the ObjList plug-in, Multiple Target Single Envelope (MTSE) morphing, and image sequences. I've taken portions of this column from my book, "LightWave 3D 5 Character Animation f/x," published by Ventana Communications Group and available through Lightspeed.

Lip sync is one of the skills that transfer directly from traditional stop-motion or cel animation to computer-generated imagery (CGI). It starts, as does everything else in animation, with a lot of foresight and planning. You don't even need to think about animating for lip sync until the script and storyboards are finalized, the voice talent has recorded all their tracks and the director and editor have pieced together the takes they want for the final soundtrack.

Once the dialog track is locked, it can be analyzed and the exposure sheets (x-sheets) written up. Track analysis is not really difficult, just painstaking. There are a relatively small number of phonemes, or unique sounds, used by all spoken human languages. Track analysis is the art of transcribing onto an x-sheet exactly when each phoneme occurs in a voice track. Doing this manually is fussy, tedious work, but now there's an easier way.

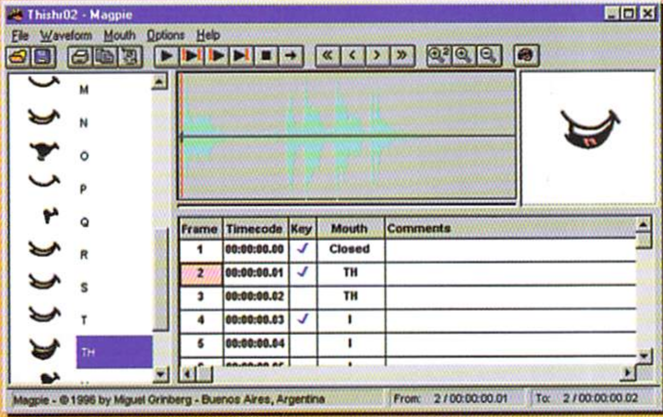
Magpie is a track analysis program written by Miguel Grinberg. To run it, you need a PC-compatible running Windows NT or 95, 16 Mb of RAM, about 5 Mb of free hard disk space, a true color graphics display and an MCI device that can play 8- or 16-bit WAV audio files. You can download Magpie version 0.9 from ftp://www.3dsite.com/pub/3dsite/magpie/magpie09.zip Magpie is copyrighted shareware and you may evaluate it for no more than 30 days. After that, you must either register and pay for it or remove it from your system. Otherwise, you're in violation of international copyright law, not to mention being very rude to Mr. Grinberg, who has graciously made this software available to animators worldwide. If you use it, please pay for it. To contact Miguel Grinberg—preferably to tell him how much you like Magpie, but also for technical support—you can send him email at: mgrinberg@impsat1.com.ar.

I recommend keeping a good dictionary handy while analyzing vocal tracks; it can save you a lot of time while you are developing your track-reading skills. Any good dictionary will have a pronunciation guide which lists the phonemes for its language, and explains the letters and diacritical marks used in phonetic spelling.

With dictionary in hand, your first step is to make a copy of the script for the vocal track, double- or triple-spaced so you can write legibly under or over each word. For this example, we'll use a digitized sample from a speech by Sir Winston Churchill, THISHOUR.WAV, which you can find on the CD-ROM. The phrase is, "This...was their finest hour." Look up each word in the dictionary. Copy the phonetic spelling of each word under the normal spelling in the script. Now you know exactly what phonemes you need, and in what order.

Start Magpie. The Magpie window contains four panes: Waveform, Mouth, Preview, and Exposure Sheet. The Waveform pane displays the sound file you will analyze. Choose File|Open, then load THISHOUR.WAV file from the CD-ROM. Opening a WAV file automatically loads a new Magpie session. [Figure 1]

Each pair of vertical lines in the Waveform pane brackets a single frame. Select the second frame from the left by clicking on it once. The frame turns red. Double-click on the frame to hear it played. You can tell from your phonetic transcript (and from listening carefully) that the sound at this frame is a soft "th" sound, the first phoneme of the word "This." Magpie refers to phoneme images as Mouths. The Mouth pane runs along the left edge of the window, listing letters or words beside their associated mouth shapes. Double-click on the mouth labeled "TH." Magpie copies the Mouth label TH to the selected frame of the Exposure Sheet pane, and the TH image appears in the Preview pane.



Frame	Timecode	Key	Mouth	Comments
1	00:00:00.00	✓	Closed	
2	00:00:00.01	✓	TH	
3	00:00:00.02		TH	
4	00:00:00.03	✓	I	
5	00:00:00.04		I	

Magpie - ©1996 by Miguel Grinberg - Buenos Aires, Argentina

From: 2 / 00:00:00.01

To: 2 / 00:00:00.02

Figure 1: THISHOUR.WAV file displayed in Magpie Waveform pane.

You can select more than one frame by dragging the mouse in the Waveform pane. Double-clicking on a phoneme in the Mouth pane will assign that Mouth to all the selected frames. You can use the different Play buttons to play part or all of the sound. As the sound plays back, the Mouths you selected will also play back in the Preview window.

Choose appropriate mouths for all the other frames, listening carefully and matching the sounds to your phonetic transcript. Human speech is made up mostly of clicks, buzzes and hisses. Look for characteristic shapes in the waveform that correspond to phonemes. For example, a sharp spike or click can represent a plosive sound such as P or B. The word "baby" would have two spikes, and you would mark the frames next to those spikes with the letter B. Buzzing phonemes like M or N look like relatively even zigzags with similar individual waveforms, sustained over several frames. Hissing S's or C's look like loud static. I encourage you to experiment and develop your own rules for identifying phonemes; observing digitized speech is a wonderful way to learn about how people talk.

> Ta daa! You have just learned a way to analyze vocal tracks that is faster and easier than traditional methods.

Find the plosives and clicks in the audio file, looking for peaks or other sharp changes within the words. Select and play them back until you can identify their start at a particular frame, then assign the appropriate Mouth to that frame.

Find the buzzes and hisses. These will appear as relatively even areas, drawn out over several frames. Select those frames, and assign the appropriate Mouth shape. The remaining phonemes will probably be mostly vowels. They tend to fill in everywhere but the clicks, buzzes, and hisses. They are also the most visible mouth shapes to animate, as they are held longer and generally require more facial distortion.

Timing good lip sync isn't just a matter of sticking an "a" Mouth in the frame where the x-sheet is marked "a." Different phonemes are held for different lengths of time and transition to and from other phonemes in different ways. Here are a few rules to keep in mind:

Snap open, close slow. The mouth should snap open quickly in a single frame, two at the most, to full extension for vowels. It should close much more slowly to hold the vowel.

Hold for emphasis. Hold important or emphasized vowels longer, just as you would hold an important character pose.

Shut up with inbetweens. Use transition or inbetween Mouths when closing slowly from a held phoneme.

Explosive plosives. Ts, Ds, Bs and Ps shouldn't be held. Snap them out in a frame or two, or your character will look mush-mouthed.

Speed kills. Don't try to keep up with a very fast speaker, your audience won't catch it. If the mouth actions become too frenetic, use inbetweens rather than full poses for alternating mouth actions.

Watch yourself. You are your own best model. Keep a mirror handy; most professional animators keep one nearby when doing facial animation. When in doubt about a mouth action, pronounce it yourself and observe what your face does.

When you've assigned a Mouth to every frame, play back the whole sound. You may need to tweak a few frames until the playback in the Preview pane lip synchs properly. When you are satisfied with the results, save your work. Magpie saves the session, including Mouth settings and the path to the original audio file, in a Magpie format with the extension .MPS.

Ta daa! You have just learned a way to analyze vocal tracks that is faster easier than traditional methods. I'd say it's worth the software registration, wouldn't you?

There are at least four ways to use a Magpie track analysis with LightWave. The simplest is to output an x-sheet, either printed directly or saved as a word processing document. This gives you a traditional x-sheet that you can mark up and refer to, but it doesn't save you much work while animating.

The next option is to model face or head objects for each Mouth, and use LightWave's ObjList plug-in to swap out the objects during a lip sync sequence. Magpie enables you to customize export formats, so you can create an ObjList text file automatically. The format of the ObjList file is simple, just a header, the frame number, and the path and filename of each object to be loaded:

```
#LW Object Replacement List
3
D:\NEWTEK\OBJECTS\HEADS\CLOSED.LWO
4
D:\NEWTEK\OBJECTS\HEADS\ALLWO
8
D:\NEWTEK\OBJECTS\HEADS\CDGK.LWO
```

Generating this will require that you use Magpie's Export Format options dialogs, or directly edit the configuration file MAGPIE.INI. To produce the ObjList file, you need to add three sections to the INI file. The first section names the Export Format:

```
[Export Formats]
Create LightWave 3D ObjList text file=
```

The second section sets the format of the output file:

```
[Export: Create LightWave 3D ObjList text file]
details=This creates a text file that can be used with the ObjList object
```

LightWave Expo New York
NewTek Incorporated

LightWave Expo New York '97

A full day of LightWave seminars and FREE exhibits

Saturday May 10

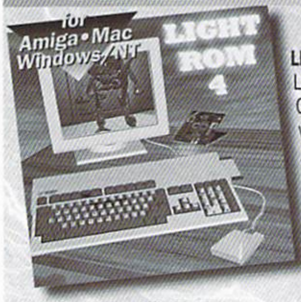
780 Third Ave NYC

(212) 979-2310

www.msd-nyc.com

NewTek INCORPORATED

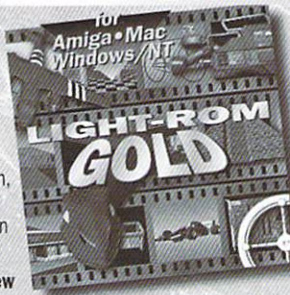
NAB SALE – PRICES GOOD UNTIL JUNE 30, 1997!



LIGHT-ROM 4, a 2 CD-ROM set features all new Lightwave objects and scene files. The bonus CD-ROM is 3,000 Jpeg Textures, a $29.95 value. See below for full description of 3,000 Jpeg Textures CD-ROM. LIGHT-ROM 4 also includes a collection of scene files by Alan Chan, author of Power FX Kit Lightwave 3D book, featuring the Lightwave 5.0 tutorials included in his book.

100% royalty free! LIGHT-ROM 4 features new material created with Lightwave 4.0 and 5.0.

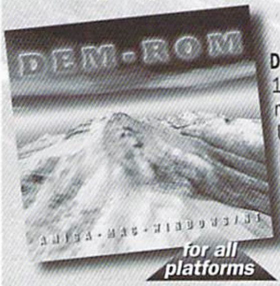
$44.95 + shipping



LIGHT-ROM GOLD represents the best of LIGHT-ROM issues 1, 2, and 3 with over 6,000 Lightwave objects and scene files. LIGHT-ROM GOLD was created for those who did not purchase LIGHT-ROM 3. Each issue of LIGHT-ROM (LR) is built upon the previous issue. LR1 had 2,300 Lightwave objects, LR2 had 3,700 Lightwave objects and LR3 had over 6,000 Lightwave objects. LIGHT-ROM 4 starts over with all new objects than what is found on LIGHT-ROM GOLD.

Both LIGHT-ROM GOLD & LIGHT-ROM 4 include thumbnail renderings for easy previewing and include the following categories Anatomy, Animals, Aviation, Botany, Buildings, Furniture, Music, Ships, Sports, Space, Vehicles, Video & many others. 99% royalty free!

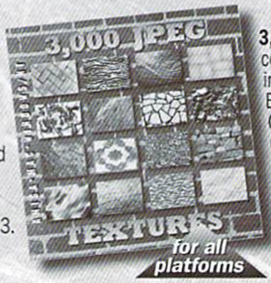
$34.95 + shipping



DEM-ROM contains over 1,000 digital elevation maps (DEMs) from the USGS for use with Vista Pro, Scenery Animator and World Construction Set. DEM-ROM originally appeared on LIGHT-ROM 3.

for all platforms

$19.95 + shipping

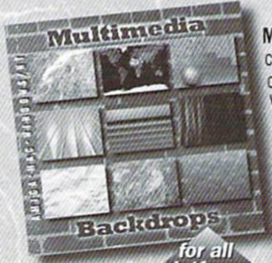


3,000 Jpeg Textures covers all categories including Brick, Bumpmaps, Carpet, Cloth, Fabric, Formica, Granite, Images, Marble, Organic, Rock, Stone, Stucco, Tiles, Wood and many others.

100% royalty free – less than 1 cent per texture!

for all platforms

$19.95 + shipping



Multimedia Backdrops contains 100 backdrops designed for Desktop Video and Multimedia work in the IFF24, TARGA, and TIFF file formats in NTSC (752x480) and PAL (768x576) resolutions.

100% royalty free – less than 40 cents per backdrop!

for all platforms

$19.95 + shipping

ORDERS ONLY 1•800•265•4041

VOICE / FAX – 502-363-2986 • E-MAIL – michael@iglou.com

Hours – 10 am to 10 pm E.S.T. Monday through Friday • Shipping is $4.95 for U.S. & Canada – $6.95 International / C.O.D. $4.50 Extra

MasterCard

GRAPHIC DETAIL

GRAPHIC DETAIL INC. • 4556 SOUTH 3RD ST. • LOUISVILLE, KY 40214 • USA

VISA

DEALERS, CALL FOR SPECIAL PRICING AND BUNDLING INFORMATION

"LIGHT-ROM," "DEM-ROM," "Multimedia Backdrops," and "3,000 Jpeg Textures" are trademarks of Graphic Detail Inc. All other trademarks are the properties of their respective companies.

replacement plug-in for LightWave 3D 5.0.

```
format={Frame}\\{MouthValue1}
header=#LW Object Replacement List
keys=1
```

The third section defines the MouthValue1 for each Mouth:

```
[Default/Values]
A1=D:\NEWTEK\OBJECTS\HEADS\AI.LWO
B1=D:\NEWTEK\OBJECTS\HEADS\MBP.LWO
C1=D:\NEWTEK\OBJECTS\HEADS\CDGK.LWO
Closed1=D:\NEWTEK\OBJECTS\HEADS\CLOSED.LWO
D1=D:\NEWTEK\OBJECTS\HEADS\CDGK.LWO
E1=D:\NEWTEK\OBJECTS\HEADS\E.LWO
F1=D:\NEWTEK\OBJECTS\HEADS\FV.LWO
G1=D:\NEWTEK\OBJECTS\HEADS\CDGK.LWO
I1=D:\NEWTEK\OBJECTS\HEADS\AI.LWO
K1=D:\NEWTEK\OBJECTS\HEADS\CDGK.LWO
L1=D:\NEWTEK\OBJECTS\HEADS\LTH.LWO
M1=D:\NEWTEK\OBJECTS\HEADS\MBP.LWO
N1=D:\NEWTEK\OBJECTS\HEADS\CDGK.LWO
O1=D:\NEWTEK\OBJECTS\HEADS\O.LWO
P1=D:\NEWTEK\OBJECTS\HEADS\MBP.LWO
Q1=D:\NEWTEK\OBJECTS\HEADS\WQ.LWO
R1=D:\NEWTEK\OBJECTS\HEADS\CDGK.LWO
S1=D:\NEWTEK\OBJECTS\HEADS\CDGK.LWO
T1=D:\NEWTEK\OBJECTS\HEADS\CDGK.LWO
TH1=D:\NEWTEK\OBJECTS\HEADS\LTH.LWO
U1=D:\NEWTEK\OBJECTS\HEADS\U.LWO
V1=D:\NEWTEK\OBJECTS\HEADS\FV.LWO
W1=D:\NEWTEK\OBJECTS\HEADS\WQ.LWO
```

This example assumes you have modeled heads to match each of the Mouths in Magpie's Default mouth set, and keep them in the directory D:\NEWTEK\OBJECTS\HEADS. Another part of the MAGPIE.INI file lists the Default mouth set images shown in the Preview pane:

```
[Default]
A=MOUTHS\DEFAULT\Ai.bmp
I=MOUTHS\DEFAULT\Ai.bmp
K=MOUTHS\DEFAULT\cdgk.bmp
N=MOUTHS\DEFAULT\cdgk.bmp
E=MOUTHS\DEFAULT\E.bmp
F=MOUTHS\DEFAULT\Fv.bmp
V=MOUTHS\DEFAULT\Fv.bmp
L=MOUTHS\DEFAULT\Lth.bmp
TH=MOUTHS\DEFAULT\Lth.bmp
D=MOUTHS\DEFAULT\d.bmp
M=MOUTHS\DEFAULT\MBP.bmp
B=MOUTHS\DEFAULT\MBP.bmp
P=MOUTHS\DEFAULT\MBP.bmp
O=MOUTHS\DEFAULT\O.bmp
U=MOUTHS\DEFAULT\U.bmp
Q=MOUTHS\DEFAULT\Wq.bmp
W=MOUTHS\DEFAULT\Wq.bmp
R=MOUTHS\DEFAULT\cdgk.bmp
Closed=MOUTHS\DEFAULT\closed.bmp
C=MOUTHS\DEFAULT\cdgk.bmp
G=MOUTHS\DEFAULT\cdgk.bmp
S=MOUTHS\DEFAULT\Cdgk.bmp
T=MOUTHS\DEFAULT\Cdgk.bmp
```

There are only 11 different image files in this set; most of them represent more than one phoneme. Each Mouth image is a 128x128 BMP file. It's easy to create your own Mouth images for the Preview pane. in LightWave, pose and light your first Mouth object, then render the frame as a 128x128 BMP file. Rename the image file to match the Mouth name, and move it to a new Mouth directory. Replace the Mouth object with the next one, and repeat. You should end up with a set of images as seen in figure 2.

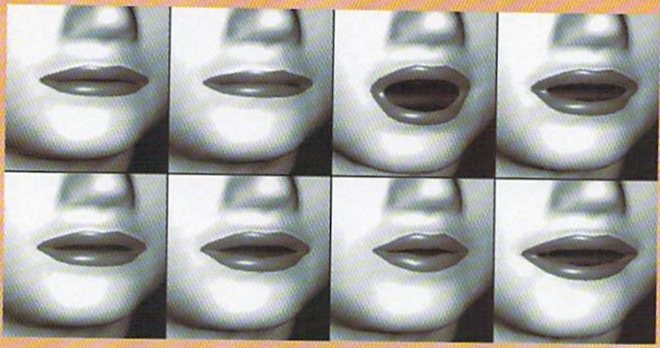


Figure 2: Magpie-compatible Mouth images rendered from LightWave 3D.

Add a new section to the MAGPIE.INI file, based on the [DEFAULT] example listed above, with the new directory name substituted for \DEFAULT. The next time you open Magpie, you can choose your new Mouth set, and see your own objects in the Preview pane.

The Mouth sets supplied with Magpie are good samples, but you can also customize your own. You may want Mouths shaped for the transitions between each of the key Mouths. Lip sync animation using ObjList is inherently more jerky and difficult to smooth, since there is no interpolation between objects. Smooth inbetweens are especially important for held vowels, as there is usually a slow transition from the first extreme pose to the more relaxed hold. If you need a smoother transition, your only option is to create inbetween Mouths. It's more work, but the improvement in your lip sync will be worth it. You can also make some of the key Mouths more specific. The F and V Mouths, for instance, should have a slightly different placement of the upper front teeth against the lower lip; in the sample sets, the two phonemes share one Mouth.

The third method of using Magpie with LightWave avoids some of these problems by creating inbetweens automatically. If you load all the Mouth objects in an MTSE chain, you can use Magpie to create an envelope file that controls the chain for lip sync. As with ObjList, the envelope file format is simple:

```
LWEN    [Header]
1
1
20      [Number of keyframes in envelope]
0       [MTSE chain value, 1=100; 0%(first object in chain)]
0 0 0 0 0 [Frame #0]
0       [MTSE chain value; 0%(first object in chain)]
3 0 0 0 0 [Frame #3]
5       [MTSE chain value; 500%(sixth object in chain)]
4 0 0 0 0 [Frame #4]
9       [MTSE chain value; 900%(10th in chain)]
8 0 0 0 0     [Frame #8]
O       [etc.]
```

You'll need to add new sections to the MAGPIE.INI file, defining the MTSE chain value for each Mouth and formatting the envelope output file. The following example is based on loading the Mouth objects in the order Closed, WQ, U, O, D, AI, LTH, E, FV, CDGK, MBP. Each object is between the most similar objects, so the inbetweens are as smooth as possible.

```
[Default/Values]
A3=5
B3=10
C3=9
Closed3=0
D3=9
E3=7
F3=8
G3=9
I3=5
K3=9
L3=16
M3=10
N3=9
O3=3
P3=10
Q3=1
R3=9
S3=9
T3=9
TH3=6
U3=2
V3=8
W3=1

[Export Formats]
Create LightWave 3D MTSE Envelope file=

[Export: Create LightWave 3D MTSE Envelope file]
details=This creates an envelope file that can be used to control
MTSE morphing for LightWave 3D 5.0.
format={MouthValue3}\\{Frame} 0 0 0 0
header=LWEN\\1\\1\\#Keyframes
keys=1
```

Note that after you export the envelope file, you will have to replace manually the #Keyframes line with the actual number of keyframes. Magpie does not (yet) do this automatically. Animating lip sync with MTSE enables you to revise and fine-tune the sequence in Layout. After you load the envelope file, you can shift keyframes or change values, add new keyframes or objects, and generally tweak to your heart's content. This is a very useful balance between the animator's need for control of the character and the time savings of semi-automated lip sync.

The fourth method of lip sync with Magpie and LightWave is to use image sequences as color, alpha, bump and clip maps. For some characters, you can combine Bone or Metamorph animation of a head object with image sequences for the mouth. This hybrid approach gives you more options for controlling the rest of the face while making it easier to coordinate lip sync. Since the mouth requires most of the controls for a completely Boned face, a hybrid head can be simpler to set up and faster to animate. You can apply the lip sync image sequence first, then animate the rest of the face to match.

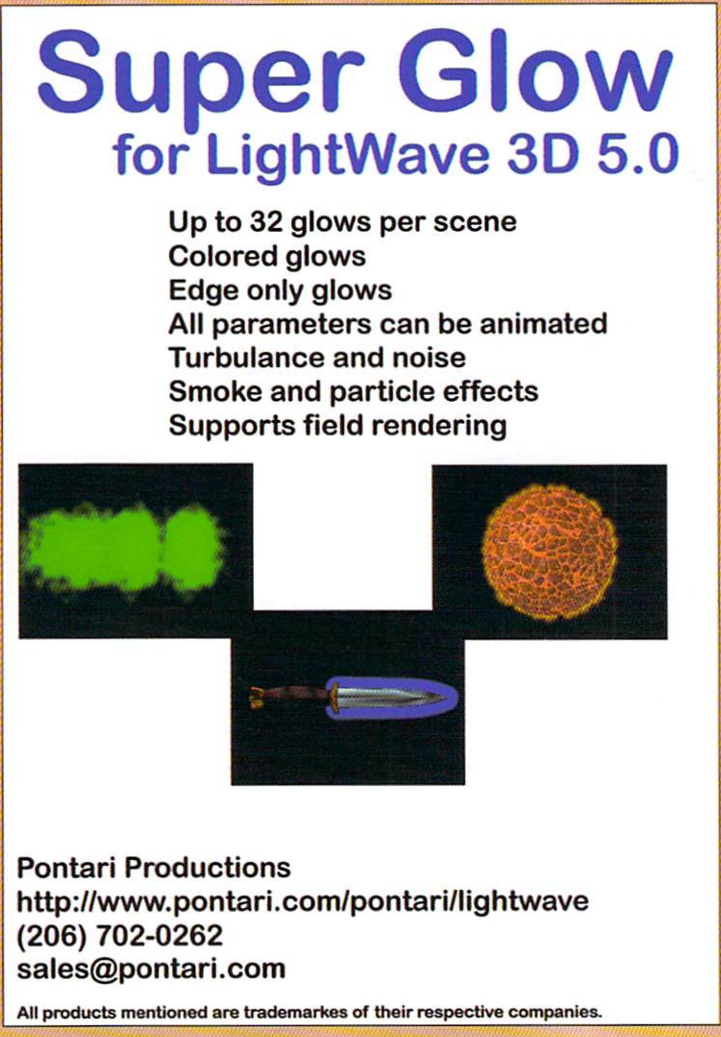
The simplest approach to lip sync image sequences is to use only the color map. This requires that the map's background color exactly match the object, or you have to use a matched alpha channel map to mask the background color. [Figure 3]

The next level is a matched bump map, which gives a sense of depth and helps blend the drawn maps with the modeled object.

[Figure 4]

Finally, a matched clip map cuts away part of the object to create an unmistakably 3D effect. You can even animate teeth and tongue objects, if you like. Clipping occurs precisely where the luma (brightness) value for the map drops below 50 percent. Since the edge of a clip map can't be dithered, if you use a low-resolution clip map, any curved or diagonal edge will show jaggies. If the bump map you are matching has a dithered edge, you can make the clipped edge smoother by duplicating the bump map, doubling or quadrupling its resolution, and converting it to a black-and-white bitmap. When you apply a clip map, be careful to set its Center in the Z axis to match the object's surface at the mouth, and set Texture Falloff so the clipping doesn't go clear through the object. [Figure 5]

Matched maps are easier to produce with graphic software that supports layers. You can draw the color map first, then move it to a protected layer and trace over it to create precisely matched alpha, bump and clip maps. An example set of matched maps based on Magpie's Default Mouth set is on the CD-ROM. If you want to "roll your own," you should consult cartoon animation books like Preston Blair's, which have good examples of lip sync mouths. When you create maps for lip sync, keep them compatible with Magpie. Even if you use higher resolution maps for the finished animation, creating a set of thumbnail images for Magpie does not take very long and can save you a lot of time and effort.


Super Glow
for LightWave 3D 5.0

Up to 32 glows per scene
Colored glows
Edge only glows
All parameters can be animated
Turbulance and noise
Smoke and particle effects
Supports field rendering

Pontari Productions
http://www.pontari.com/pontari/lightwave
(206) 702-0262
sales@pontari.com

All products mentioned are trademarkes of their respective companies.

You don't have to specify a map for each frame in a sequence. LightWave holds the last used map until the next higher number in the sequence is reached. For example, if the file order is 1, 2, 5, 10, 11, the displayed file sequence will actually be 1, 2, 2, 2, 5, 5, 5, 5, 5, 10, 11. This saves a lot of work in laying out a lip sync image sequence, since you only have to mark the keyframes.

There are only 11 unique Mouths in the Default set. You can build a lip sync image sequence by making a bunch of copies of each Mouth image file, numbered in the order you want them to appear. For example, if the Mouth for "O" appears in the x-sheet at frames 5, 18, and 24, you need to make three copies of the "O" Mouth, renamed LIPC0005.BMP, LIPC0018.BMP and LIPC0024.BMP. When LightWave 3D loads the images from the LIPC(sequence) for frames 5, 18, and 24, the "O" Mouth copies will be loaded. The easy way to duplicate all those Mouth images is to write a batch file. With the right changes to MAGPIE.INI, Magpie can do it for you.

The first step is to set up a directory of the original Mouth images with consistent filenames. I like to use the first four spaces of the filename for the Mouth label, leaving the remaining four to differentiate between color, alpha, bump and clip maps, like this:

```
D:\NEWTEK\IMAGES\MOUTHS\CDGK_COL.BMP
D:\NEWTEK\IMAGES\MOUTHS\CDGKALFA.BMP
D:\NEWTEK\IMAGES\MOUTHS\CDGKBUMP.BMP
D:\NEWTEK\IMAGES\MOUTHS\CDGKCLIP.BMP
```

The next step is to add three new sections to the MAGPIE.INI file, labeling the export format, defining the export format, and setting the MouthValue2 variables:

```
[Export Formats]
Batch Copy All Mouth Images=

[Export: Batch Copy All Mouth Images]
details=This creates a batch file to duplicate the color, alpha, bump and clip mouth
images into a lip sync image sequence compatible with LightWave 3D 5.0.
format=COPY {MouthValue2}_COL.BMP
D:\LIPSYNC\LIPC{Frame;4;R;0}.BMP\\COPY {MouthValue2}ALFA.BMP
D:\LIPSYNC\LIPA{Frame;4;R;0}.BMP\\COPY {MouthValue2}BUMP.BMP
D:\LIPSYNC\LIPB{Frame;4;R;0}.BMP\\COPY {MouthValue2}CLIP.BMP
D:\LIPSYNC\LIPP{Frame;4;R;0}.BMP
header=REM Batch file to create image sequence
keys=1

[Default/Values]
A2=D:\NEWTEK\IMAGES\MOUTHS\AI__
B2=D:\NEWTEK\IMAGES\MOUTHS\MBP_
C2=D:\NEWTEK\IMAGES\MOUTHS\CDGK
Closed2=D:\NEWTEK\IMAGES\MOUTHS\CLOS
E2=D:\NEWTEK\IMAGES\MOUTHS\E___
F2=D:\NEWTEK\IMAGES\MOUTHS\FV__
G2=D:\NEWTEK\IMAGES\MOUTHS\CDGK
I2=D:\NEWTEK\IMAGES\MOUTHS\AI__
K2=D:\NEWTEK\IMAGES\MOUTHS\CDGK
L2=D:\NEWTEK\IMAGES\MOUTHS\LTH_
M2=D:\NEWTEK\IMAGES\MOUTHS\MBP_
N2=D:\NEWTEK\IMAGES\MOUTHS\CDGK
O2=D:\NEWTEK\IMAGES\MOUTHS\O___
P2=D:\NEWTEK\IMAGES\MOUTHS\MBP_
Q2=D:\NEWTEK\IMAGES\MOUTHS\WQ__
R2=D:\NEWTEK\IMAGES\MOUTHS\CDGK
```

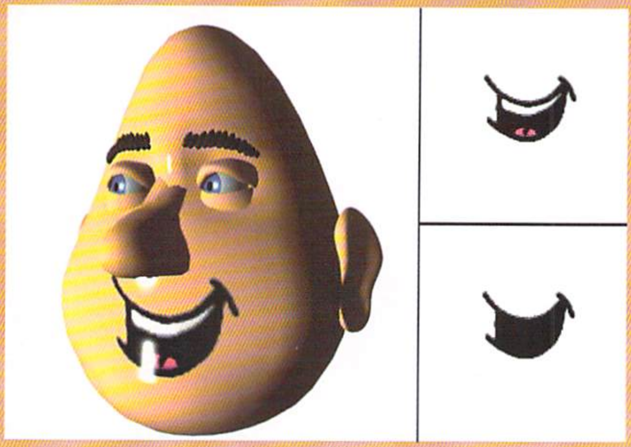


Figure 3: Head with color and alpha Mouth image maps applied (left), and the maps used (right).

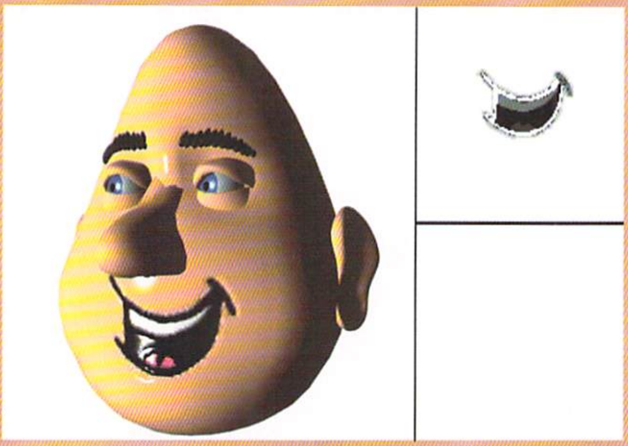


Figure 4: Head with bump map added (left), and the map used (right).

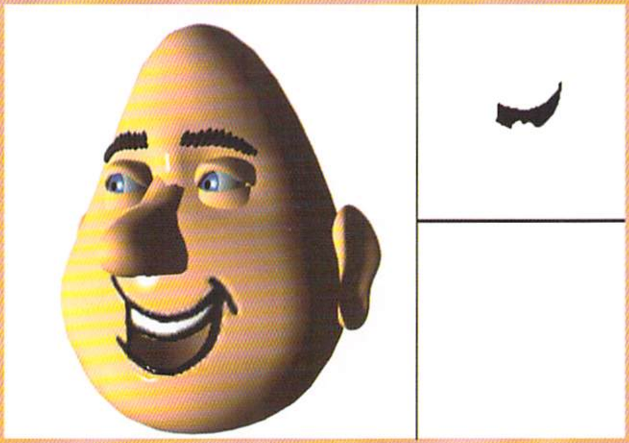


Figure 5: Head with clip map added (left), and clip map used (right).

```
S2=D:\NEWTEK\IMAGES\MOUTHS\CDGK
T2=D:\NEWTEK\IMAGES\MOUTHS\CDGK
TH2=D:\NEWTEK\IMAGES\MOUTHS\LTH_
U2=D:\NEWTEK\IMAGES\MOUTHS\U___
V2=D:\NEWTEK\IMAGES\MOUTHS\FV__
W2=D:\NEWTEK\IMAGES\MOUTHS\WQ__
```

Note that the consistent four-character prefix to the Mouth filenames means you only have to define one set of Mouth Value variables to produce four sets of Mouths—color, alpha, bump and clip—with the Magpie batch file, like this:

```
REM Batch file to create image sequence
COPY            D:\NEWTEK\IMAGES\MOUTHS\CLOS_COL.BMP
D:\LIPSYNC\LIPC0003.BMP
COPY            D:\NEWTEK\IMAGES\MOUTHS\CLOSALFA.BMP
D:\LIPSYNC\LIPA0003.BMP
COPY            D:\NEWTEK\IMAGES\MOUTHS\CLOSBUMP.BMP
D:\LIPSYNC\LIPB0003.BMP
COPY            D:\NEWTEK\IMAGES\MOUTHS\CLOSCLIP.BMP
D:\LIPSYNC\LIPP0003.BMP
```

If you've got a long shot with a lot of speaking, the number of uplicate Mouth files is going to get very large very quickly. You may have to render the shot in segments, limited by how many images you can store at one time. Multiply the number of lines in your batch file by the size of the largest file you are duplicating to get an upper-limit estimate of the space you need. Also, keep your files organized. If you mess up a directory name, you can end up with one character lip synching another's lines. Comical, sure, but the audience will be laughing at you, not your animation!

When you are ready, execute the batch file. If all goes well, the batch file makes copies of the appropriate Mouth images and places them in the correct subdirectory. Now do some quality control. Did the files end up where you expected them? Open up a few files of each map type, and compare them with the x-sheet. It's much better to catch any mistakes now than after rendering the entire shot.

After applying the image sequences and rendering a test, you may not be satisfied with the lip sync. Rather than repeat the whole process, you can try slipping the image sequence, just as an editor can slip a soundtrack. In Layout's Images panel, the Frame Offset box is just below the center of the panel. Using a positive Frame Offset value is like slipping the image sequence ahead. Add an Offset of 5, and the sequence image for frame 15 will be used in frame 10 of the animation. Usually, you will want to push the image sequence ahead, so the screen has a chance to show the lip image before the audience hears the phoneme. Some animation houses slip the images ahead three or four frames as a matter of standard procedure. Nobody seems to know why, but it works for the audience.

Those are the basics of lip sync with LightWave. As with most skills in character animation, you can learn the basics very quickly, but honing and polishing your timing and caricature skills is a lifetime pursuit. Keep practicing!

Doug Kelly is the author of the newest LightWave book to hit the market, 'LightWave 5 Character Animation f/X'. He can be reached via e-mail at kcc@apk.net.

CD-ROM

The following items for this article are contained on this issues LightWavin' Magazine CD-ROM.

THISHOUR.WAV

MOUTHS directory, containing matched color, alpha, bump, and clip maps

MAGPIE.INI

HASTA.AVI

HEAD.LWO

EYE.LWO

EYELIDL.LWO

EYELIDR.LWO

HEAD.LWS

World Construction Set™ V2

Now you can get the best photorealistic terrain rendering and animation software on the planet.

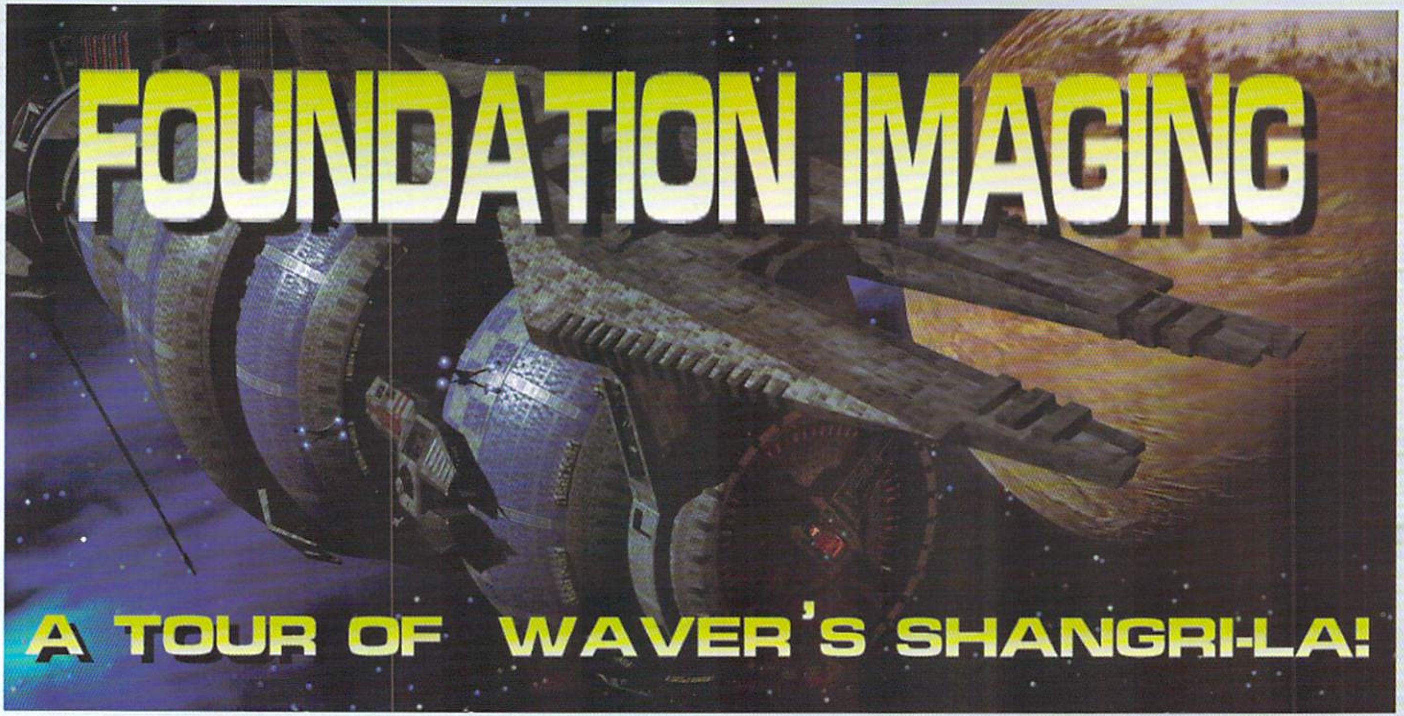
Multi-platform, science-based and artist friendly.

Supports Lightwave 3D and 3D Studio MAX!

Dream it, Create it, Animate it.

Find out more: Phone: (303) 659-4028
Email: WCSINFO@QuestarProductions.com
Web: http://www.QuestarProductions.com

Questar Productions



FOUNDATION IMAGING

A TOUR OF WAVER'S SHANGRI-LA!

What has 48 legs, a big slice of prime time, and an even bigger smile? If you said 'Foundation Imaging,' you're right

The 'house that Ron and Paul built' has matured into a 'force majeure' on the Hollywood scene. By all accounts it's also a pretty nice place to work! This busy CG concern is growing by leaps and bounds (FI recently doubled in size)! So, the chances are 'fair to middling' that at least a few of you may one day claim your animator's seat there. Here's our little look at what you might find when you arrive.

Foundation's point position in the desktop invasion of CG owes a lot to the vision of co-founders Ron Thornton and Paul Bryant. Thornton currently sits as Visual Effects Director, and Bryant as Technical Director. We asked Ron Thornton "Did you ever imagine at the start it would go this far?"

"I had a suspicion. Paul and I, when we started this thing off thought we'd maybe got a 6 month head start on everybody, and it turned out that wasn't true at all. It took a long time for everyone to get into using desktop computers for doing this stuff. All the way up until last year there were relatively few facilities that were - Amblin, ourselves, Flat Earth, Area 51, some game companies as well of course, and that was pretty well it. There was a certain delay - I think because it takes a while to get the scripts through the system [that could take advantage of the newly acquired access to less expensive CG effects - ed.]"

"...and this will be your workstation!"

We asked him to give us a sketch of the working environment at FI. Since a CG house is kind of a cross between NASA and an artist's colony, we wondered how the needs of the 'artistic' temperament are balanced with production necessities.

"I've tried to approach it as more of a personal philosophy than anything else, but this job is hard enough without trying to deal with the politics of it! Dealing with executives and so on can be crushing for guys used to a somewhat simplistic and linear environment - so we really try to prevent that from affecting the guys, try and isolate them as much as possible from those stresses.

We give the guys a large measure of autonomy. There are CG houses that don't. (At FI) when you do a shot you build the models for it, light it, animate it. When you do a shot it's yours! In a traditional arrangement you might make the model and toss it over to someone else, like an assembly line process. There are still CG houses that do that. I prefer the guys to be very well rounded. Then when you're building a model, you're looking to make something that you can animate. So I think it teaches a certain 'practicality' to people - plus it gives them that 'job satisfaction'. They can look at that shot and say, 'Hey, I did that one!'."

Of Pitfalls and Demo Tapes...

Of course, the simple imperatives related to 'what works on the screen,' and the artistic persuasion of the client exists at FI as elsewhere, so autonomy has its limits...

"There are so many ways to 'skin a cat,' but there are certain rules that you've got to follow. Especially with guys who come from a computer background, who aren't originally filmmakers, it can take a little while to learn these things.... the most common thing that I find lacking in people's work is a lack of editorial experience. Beginners look at each shot like it's the whole story, as opposed to it being one part of a larger sequence.

We've had a bunch of demo reels from people, and they've 'crossed the line' right in the middle of a 'dogfight' sequence. It's so jarring!! I'm thinking 'Why don't they see that, can't they see that?' But you know, when you're not used to it, when you're not thinking about it, it never really comes up. So, there are certain rules that you follow with regard to composition, lighting, camera position and so on, and you've got to look at the big picture and not in regard to your shot alone."

Speaking of demo tapes, is it safe to assume (since at lot of FI's work involves exploring the outer reaches of the galaxy) that 'interpretations' of a famous pink bunny crossing the landscape would be inappropriate subject matter?

"Well, unless it's REALLY real looking. As far as I'm concerned, I really don't care if there's a single space ship in the reel. I just want to see quality."

Since another FI notable has often had something to say about this matter we thought we'd ask Mojo for his views too:

"The animation we're receiving is getting much better, but a lot of people are still sending out stinkers. I really think that most people know when their reel isn't up to speed; however, they seem eager for people to see what they've done so they send it out anyway. Don't. We don't care what's on the reel as long as it's 'good'. People who send us poor animation are not just telling us that they can't animate, but that they can't tell the difference between good and bad animation."

Chain Me to the wall!

The traditional image of a major league animator involves a mouse and a monitor, a case of 'Jolt,' and a set of leg irons to keep him at his workstation. We asked Ron Thornton if it's possible for an animator at FI to have a life outside Layout?

"Yes! If they don't - it's a very frequent thing in the film industry to burn people out, lay them off and get someone else... it's a different world, it can be very traumatic to someone coming in. We don't generally want people putting in long nights here, working weekends. I think it's much better to go home and come back refreshed the next morning."

Still, any 'new kid on the block' in such august company must feel a little intimidated - how are they introduced into the FI workflow?

"It takes everyone several weeks just to get used to where everything is, and who does what. We basically have a hierarchy - myself and Paul, Head of the Animation Dept., Supervisors, the animation crew, then finally the interns as well. The Supervisors give out the actual shots or models or whatever has to be done.

It works (for new interns) because of the way we've arranged things here. Everyone is kind of out in the open, so it's really easy for someone to say 'Hey, how do you turn on MetaNURBS again?'" [Sure, I just bet that they're ALWAYS asking that, Ron!]

"There Are No 'Grunt' Animators Here..."

Becoming part of an organization like FI, with it's 'team approach' requires more of a candidate than just good technical skills. We asked what sort of problems might crop up with new talent:

"We get about a 10% that don't stay. It's usually that they just don't get on in the environment. Some people need a little bit stricter (setup). Others just aren't good communicators, which is very, very important - to be able to communicate ideas, and difficulties. If you have a problem with a shot you need to be able to tell someone exactly what the problem is. Other times, people just don't fit. It's not perfect for everybody.

We require people who are self-starters - we're giving them that responsibility. We can't apply continuous attention. We don't want somebody who is coming along with every polygon they make and requiring you to approve it.... Everybody has a responsibility. There are no 'grunt' animators here. They all contribute very much to the end product."

Coming Attractions?

Some say that 'to take the joy out of something you love, you merely need to start doing it for a living.' If that were true, Ron Thornton would have to be a pretty woeful soul - but does he sound jaded to you?

"The coolest thing as far as I'm concerned is that it's a constant learning process - that's how I got involved in visual effects in the first place... it's an unbelievable problem solving issue. You're faced with a line of dialogue, or a line of script and it's something that doesn't even exist!

The more advancements that take place, the more tools you've got available to you, then a lot of this happens quicker, and becomes more complicated. A lot of the character animation things that weren't ever in LW are now starting to come to the fore... there definitely has been a drastic change."

Does this mean broader horizons at FI?

"Very much so! There are other areas that the industry is moving into. We want to continue what we're doing, but also get into a position where we'll also be creating our own material. We've already done that to an extent with Hypernauts."

Is motion picture work part of that future?

"We're actually working on that now. We're working on a sequence for an action thriller, 'The Jackal' (an upcoming Bruce Willis picture from Universal). There are no space ships in it - it's all real stuff that we've got to match exactly. We've already done tests, and the execs at Universal are very happy with what we've done so far."

There is a broad range of projects underway at FI right now, no doubt prompting the recent expansion - we pried a bit for our readers...

"There are a couple of things that I can't talk about just yet - but we're working on a show making prominent use of the cel animation look. As well, we're very proud of a 'Borg' episode of Star Trek Voyager that we've recently contributed to."

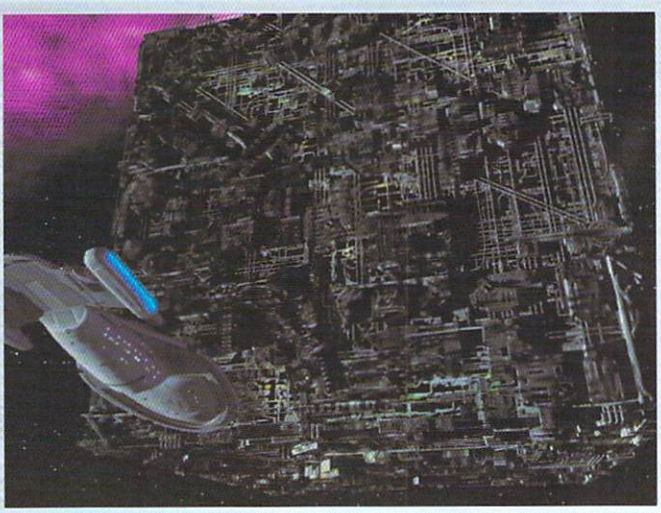


FIG. 1 - The Borg turns up in the Delta Quadrant...there goes the neighborhood! (From the Star Trek Voyager episode 'Unity' courtesy of Paramount TV)

Crew at FI. Back Row: Daryl Sebert, Trevor Peirce, Kitt Beigle, Emile Smith, Cindy Mercado, Paul Bryant, Ron Thornton, Sherry Hitch, Bruce Pearson, Dani Plantec, Kevin Kipper, Jeffery Scheetz, PJ Foley. Front Row: Karen Thornton, Stacie Sharp, Mike Donahue, Mike Stetson, Victoria Catlin, Fred Kuramura, Kevin Quattro, Rob Bonchune

Mojo included a pat on the back in his own comments on this the Voyager episode in question ('Unity'): "Emile Smith did an excellent job building a new Borg Cube (Fig.1), which is a hybrid of the old TV series cube and the one from 'First Contact.' We also took a lot of care to make the Voyager look as good as possible, which included adding detailing to the ship, putting images in the large-scale windows and rendering at twice video resolution (high-res mode).

These frames contain more graphic information than standard TV resolution images and actually retain much of that detail when they are reduced to standard video sizes. The result is a slight, yet very noticeable improvement in clarity and overall image quality. This process also enhances anti-aliasing, a necessity for the very flicker-prone Borg ship." Things are looking up in the Delta Quadrant!

What else could Thornton tell us about?

"We're probably going to be working on a children's TV series with Saban Entertainment (the 'Power Rangers' folk - ed.) This is a fun show, a nice show.

Among other things we want to do are some works which are entirely CG, hopefully one of which is going to be a serious science fiction movie!"

(Another current FI project is a one hour NBC comedy special called 'steve.oedekirk.com'. Oedekirk, the comedian who directed the 'Ace Ventura' movies, will star in the special. It employs the device of a boy playing with some CD-ROMs to weave together various sketches. Jeff Sheetz is supervising the extensive CG work required. Particularly heavy use of Lightwave 3D is involved in a three minute sequence for a video game parody called 'OedeBattle' (Fig.2). Waver's can watch for this in May!)

'Shoulde Olde Acquaintance be Forgot...'

For years, Foundation has been synonymous with the compelling visual appeal of Babylon5, and we wondered how the father of that 'look' felt on passing

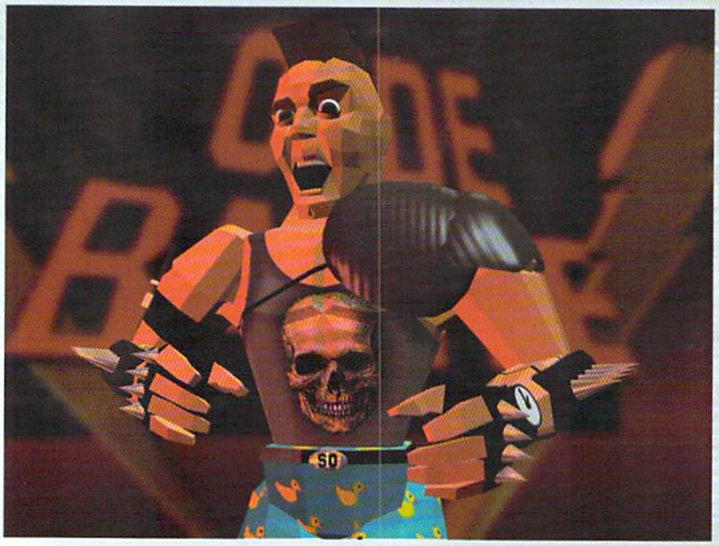


FIG. 2 - 'OedeBattle' scene from upcoming NBC comedy 'steve.oedekirk.com'.

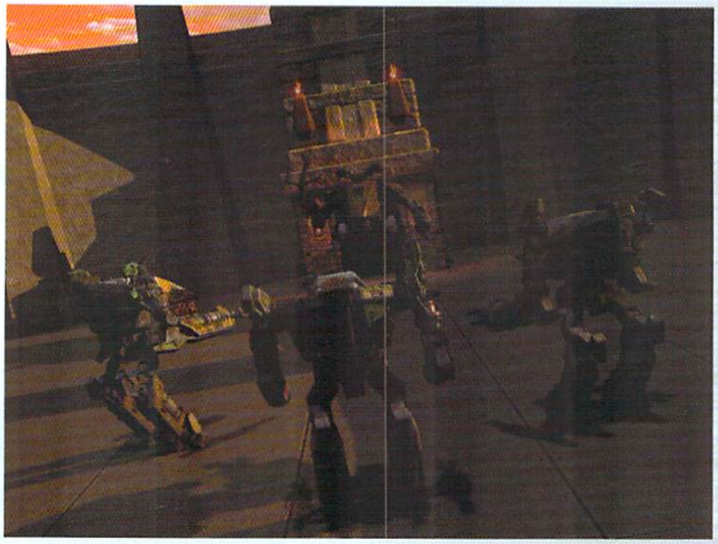


FIG. 3 - Hypernauts classic 'mechs'... ready for new action?

the torch into other hands. Thornton was characteristically gracious, and declined to comment on the 'politics' involved. He did have something to say about the visual quality of B5 now though:

"So long as the stuff doesn't go outside of the original idea I'll be very happy. I saw an episode last week where there were a lot of ships in it, and a bunch of NEW ships. I was extremely pleased to see that the new ships had the same level of innovation that went into them - that they were just 'off the wall.' They were really great and I liked them a lot."

'Hypernauts,' Foundations major foray into Saturday morning 'kid's fare' on ABC, received rather short shrift. The experiment in using Lightwave to raise the visual quality of children's viewing alone certainly seemed worthy (Fig.3). Will we see anything in this vein again?

"Oh, absolutely, you can bet on it. The toy companies that we ended up signing with were extremely happy with it, and these guys do exhaustive research on this sort of thing. They felt that if all had gone according to plan it would have been one of their most popular lines. Unfortunately, it was one of those situations where we were in the wrong place at the wrong time... all to do with the way in which executives work."

Is the Battle for Hollywood Won?

The 'revolution' that began with the Video Toaster and Lightwave came as something of a shock to Hollywood and the status quo. With several successful years now invested in applying this technology, has Foundation seen a change in the perceptions of the high end market?

"It's helped a lot. However, there has been a lot of P.R. work done by SGI. They've really tried to sell this 'It ain't CG unless it's SGI' thing. Even if you're just shooting a model out back they'll say 'ooh, is this SGI?' You have to think of it from their point of view. In their knowledge, all that they've learned is from these free seminars put on by SGI, so they've implanted this idea..."

Is Foundation satisfied that (even with some of the recent changes in pricing, and advancements by other 3D applications) LW continues to provide a significant price/performance advantage?

"Absolutely! LW has advantages that the others don't have. We're constantly looking at other apps - we constantly evaluate, analyze; but there never has been another app that will replace it as an overall tool. Yes, sometimes they have little things that would be very helpful. I mean, there are some plug-ins for 3D Studio Max that would be just great, that LW doesn't have - but it wouldn't be worth changing the entire platform just for that, because there are certain things that 3DS lacks that LW does have!"

Three Wishes?

On that point, what would be important additions to LW 3D for Foundations purposes? A frequently voiced request, for example is the implementation of UV mapping....

"Yes, UV mapping would definitely be the 'cherry on top of the cake.' Animate-able MetaNURBS in Layout, for doing 'squash and stretch' things would be very good. I still haven't had a chance to really get into Puppet Master or Con-Motion and I think they're going to be really good, but generally more character animation tools, a good interface for motion capture. I'd really like to see a 'plug-and-play' motion capture system..."

Some animators have expressed the view that motion capture is not a 'worthy' tool, that it's a 'cheat' of sorts, in the same way that some disdain rotoscoping...

"The way I look at it is as a good educational tool. Once you get this information into the computer, then animators can begin to analyze the action - it makes it easier for them to work out issues of movement, kinetics... "

'Can I Come Too?'

I wondered aloud whether the higher expectations of the market and the constantly rising target of base rendering speed were going to make it difficult for beginners with an eye on an FI stool. I was reassured by Ron's response:

"No... quite the contrary! If you can afford to buy anything over a Pentium, it's still there, everything you need."

Listening to members of Lightwave's pantheon enthuse about the unabated delight they find in their work, the explosive future (no pun intended) of CG in the industry, and the vigor of our favorite 3D package is an exhilarating experience! Doubtless Lightwave and Foundation Imaging will share many more triumphs in the future. The prospect is heartening, and we celebrate with them. Now, if you'll excuse me, I've got to go and burn my demo tape!

Lightwavin' Magazine and I want to express our sincere appreciation for the courtesy and co-operation shown us by the staff at Foundation Imaging in the preparation of this article, and in supplying and securing permission to use the images accompanying it. Special thanks go to Jeff Sheetz and Stacie Sharp at FI, and to Paramount Television, who made the 'Borg' Image from the Star Trek Voyager episode 'Unity' available to us.

Compositing

Faking Shadows

by Emile Smith

With the advent of Open GL in Lightwave's version 5.0, the ability to view a model and see it shaded in real time is a valuable asset for any visual effects artists' toolbox, but using Open GL is valuable in many other ways you might not have thought of. Many of you may have become familiar with the trick of viewing an object in Layout with Open GL enabled and grabbing a screen shot. Importing this screen shot into Photoshop, creating your texture, and loading it back into Layout can give you a perfect fit for a models surface, but did you know this also works for creating light masks?

When compositing in Lightwave, either for very simple or very complex shots, matching the shadow shading on an object or element with the shadows of a background plate can either make or break the shot. Let's create a very simple shot to illustrate how easy this can be to accomplish.

For starters, lets say the film for a crucial shot of the exciting new series, "The Ball People," has been returned from the lab with water spots all over the negative. The producer wants you to fix it so they don't have to send the crew out for another day of expensive shooting, (we all know this never happens.) In this shot, a ball was supposed to roll (or stroll, they are ball people, right?) across the ground and under a porch. A few frames with the ball out of frame weren't damaged, so these are supplied to you as the background plates (FIG 1).

Because of the time of day, you happen to notice that there is a shadow cast from the porch onto the ground that you need to match to make the shot believable. The first thing you do is create a plane in Modeler that you will use as your illustrious ground (FIG 2). Give it a distinctive surface name such as, 'ground,' save it and load it into Layout.

Your next task would be to load your background plate into Layout. In the effects menu, use it as your background image. (At this point I would have Open GL turned off because of the time it takes to draw the background image, or, if you have one of the new 4000 Giga-Hertz Alphas like I have at home for word processing, leave Open GL on). In the effects menu, select BG Image, as your Layout background. In your surfaces menu, use the background image as a front projection map for your ground, and for now, set the luminosity and diffusion levels to something in the neighborhood of 50%, (you'll probably have to change this later on, but for now, it's just dandy.)

Back in the main display of Layout, move your camera so that it matches the approximate position and rotation of the camera that actually took the plate, and move, squish and push your plane into the position to use as your ground. Line up the edge of the plane so that it falls along the edge of the shadow in the background plate and the main body of the plane is in the area not in the shade (FIG 3).

As for the light, change it to a spot light (FIG 4), and place it above the plane, change your view to look through the light (FIG 5), and position it so that it is falling from the same direction and angle as the main light source in the original background plate.

If all you wanted to do were to have the object stop casting a shadow at the edge of the shadow in the background plate, that would be it. The point here is to have the shadow start falling along the ball as it moves from the lit area and into the shadow. Now, for the first time, in the options panel in Layout, turn on Open GL. Also turn off the grid display. If you have changed your view from the light, change it back and you should see your ground plane in full living color, or in full living gray if it is still at the default color. (FIG 6) If you don't see the object in Open GL, make sure the object is set to display Open GL in the scene window.

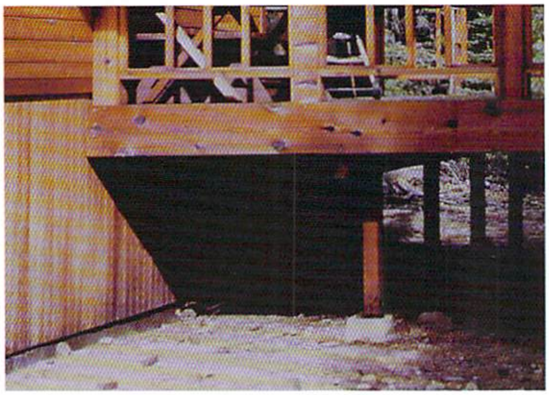
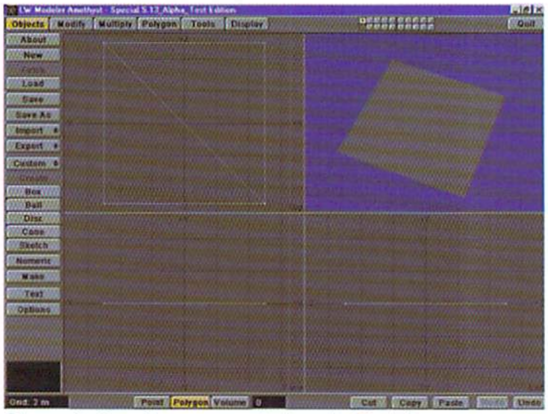
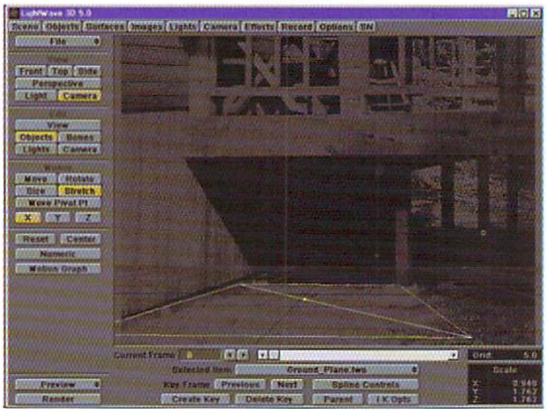


Figure 1: Background plate.


LW Modeler Amethyst - Special 5.13_Alpha_Test Edition
Objects
Modify
Multiply
Polygon
Tools
Display
Quit
About
New
Load
Save
Save As
Import
Export
Custom
Box
Ball
Disc
Cone
Sketch
Numeric
Make
Text
Options
Grid: 2 m
Point
Polygon
Volume
0
Cut
Copy
Paste
Undo
Figure 2: Creating a ground plane in Modeler.


LightWave 3D 5.0
Scene
Objects
Surfaces
Images
Lights
Camera
Effects
Record
Options
SN
File
Front
Top
Side
Perspective
Light
Camera
View
Objects
Bones
Lights
Camera
Move
Rotate
Size
Stretch
Move Pivot Pt
X
Y
Z
Reset
Center
Numeric
Motion Graph
Current Frame
Grid
5.0
Selected Item
Ground_Plane.lwo
Key Frame
Previous
Next
Spline Controls
Create Key
Delete Key
Parent
I K Opts
Scale
Preview
Render
Figure 3: Matching the ground plane to our background shot.

On your keyboard, press the 'print screen' button, which is usually located next to the function keys, and start up Photoshop or your favorite image processing program (We've included the excellent program, Paint Shop Pro, on the companion CD-ROM for those of you who do not currently have a powerful image processing program). Create a new document in Photoshop. It should default to your screen setting, (1024x768, 800x600, etc..) Select paste from the edit menu, (or control-v,) and tah-dah, the screen you captured in Layout should appear in your new Photoshop document (FIG 7). Crop the image so that the image will be a square the size of the lights bounding ring (FIG 8). Using the lasso, hold down the, 'alt,' key, and select a line along the edge of the plane, from one edge of the document to the other, and continuing with the lasso, select the rest of the image on one side of the line that contains the body of the plane. Fill this with white (FIG 9). Select the inverse, (shift-control-i,) and fill this with black (FIG 10). Now you have a map for the light that will allow light to go through the white area of the document and not through the black area.

Save your image, and back in Layout, load this image and use it as the projection image of your spotlight (FIG 11). Load in your ball object, (it's alive, remember,) and create the keyframes you need to have it roll along and off the edge of the plane to go into the shadow of the porch (FIG 12 & 13).

Render out some test frames with the ball in the lit area and adjust your luminosity and diffusion settings on the ground plane accordingly to have the ball's shadow match the shadows in your background plate.

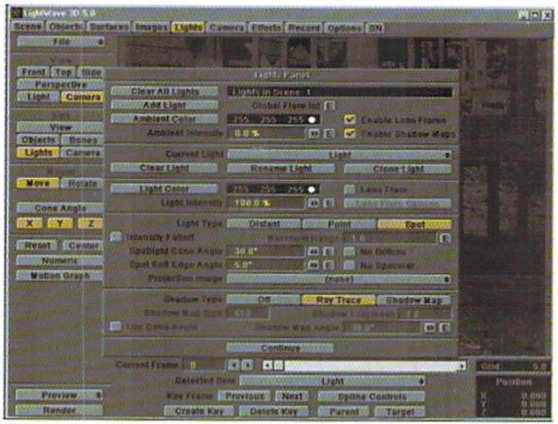


Figure 4: Adding a spot light and its settings.

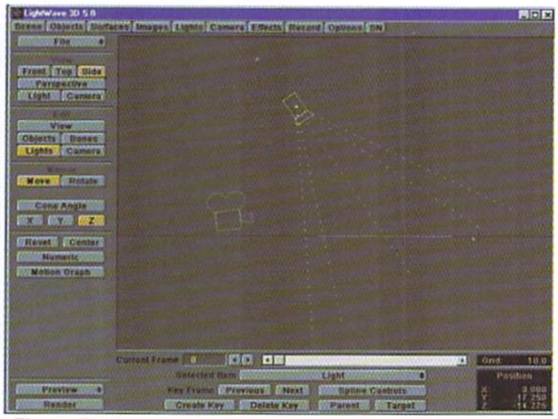


Figure 5: Matching the real world lighting of the BG plate.

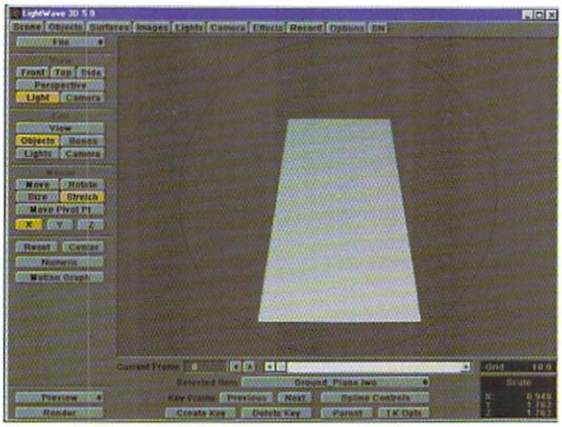


Figure 6: The ground plane as seen with Open GL.

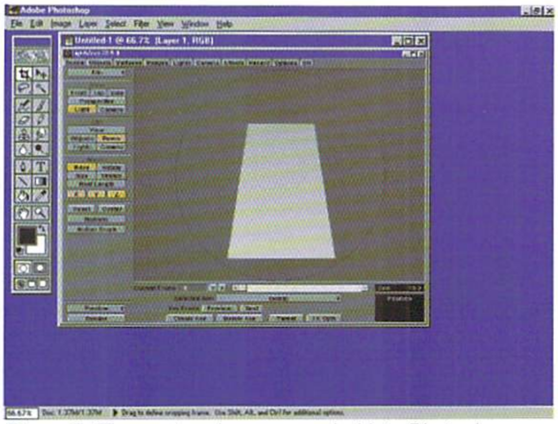


Figure 7: The captured screen copied into Photoshop.

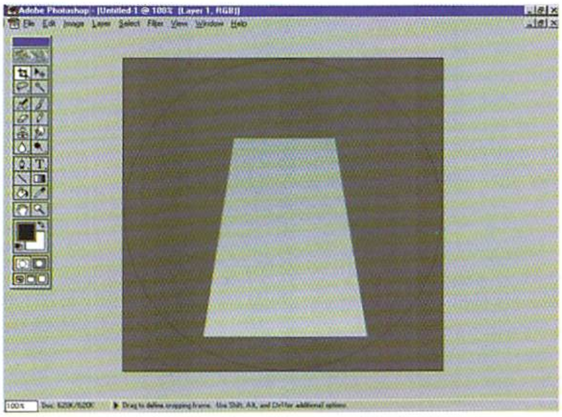


Figure 8: The screen shot now cropped.

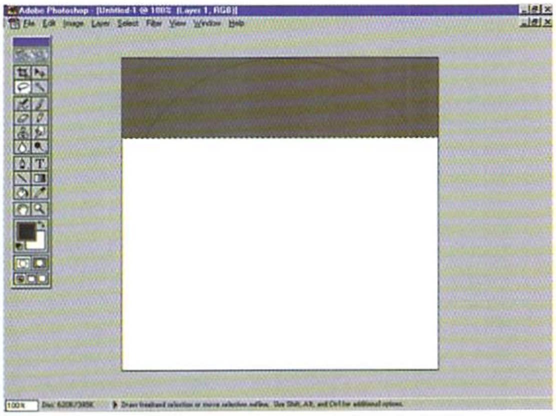


Figure 9: Filling our image with white.

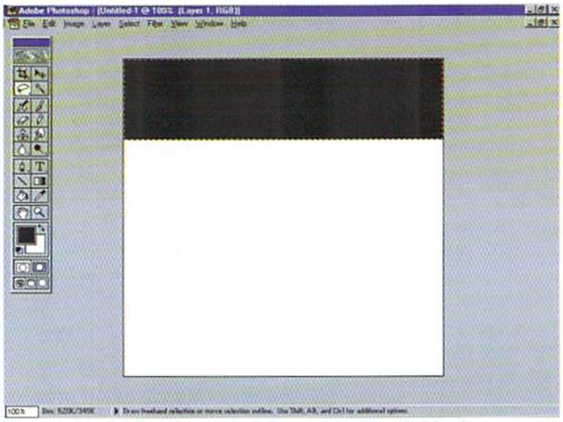


Figure 10: Filling the remaining portion with black.

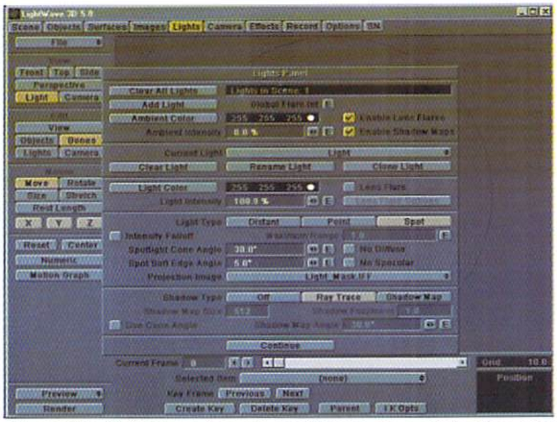


Figure 11: Setting up to use our image as a projection map.

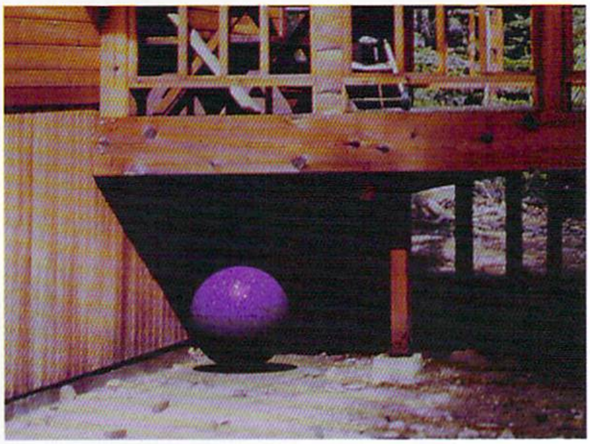


Figure 12: The completed scene with the ball ready to be moved.

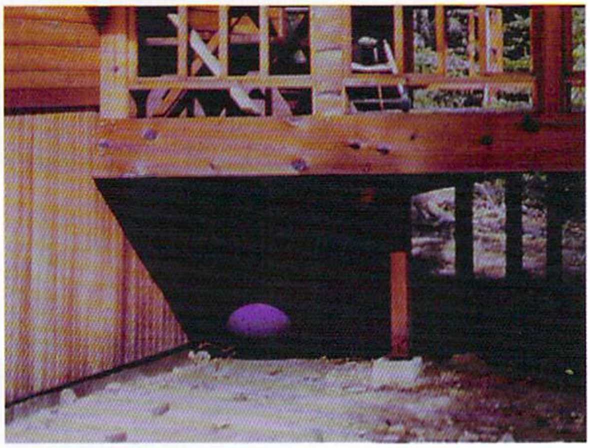


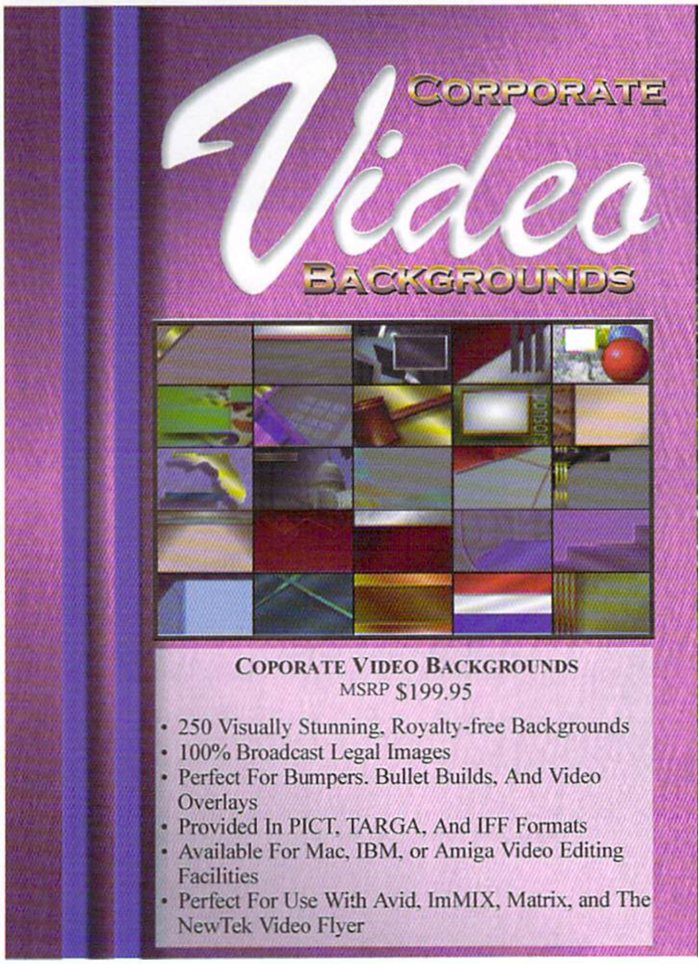
Figure 13: The ball object now becomes shadowed

There you have it. Magical shadows that appear exactly where they should. You can now go back into Photoshop and give the transition from black to white a soft edge if you want, and you can use the same technique on a 'fill light' to light the ball when it is in the shadow. You could also make the black area of your light map a shade of gray to allow some light through. Use whatever works best. Without too much trouble and without trying to place an object into your scene to cast a shadow, you have simply and quickly matched the shadow in the shot and allowed the ball people to live a happy, shadow filled life.

Emile Edwin Smith is currently an animator at Foundation Imaging working on Star Trek: Voyager and Batman the Animated Series movie among other projects. He graduated from the University of California at San Diego (UCSD) and can be reached at emile@foundation-i.com or eesmith@earthlink.net.

CD-ROM

Included on the companion CD-ROM is the extremely powerful image processing program - Paint Shop Pro.



Coporate Video Backgrounds
MSRP $199.95

- 250 Visually Stunning, Royalty-free Backgrounds
- 100% Broadcast Legal Images
- Perfect For Bumpers, Bullet Builds, And Video Overlays
- Provided In PICT, TARGA, And IFF Formats
- Available For Mac, IBM, or Amiga Video Editing Facilities
- Perfect For Use With Avid, ImMIX, Matrix, and The NewTek Video Flyer

Leo Martin's
Surface Pro
for LightWave 3D
Surface Pro
MSRP $99.95

- Contains 60 seamless, imagebased surfaces which are instantly available through LightWave
- Contains numerous scene files and objects
- Also includes a variety of Tech Maps with many uses: from spaceships to buildings to hitech equipment
- Some of the available surfaces are: Circuit Board, Nebula, Alien Skin, Water, Flame, Wood, and many many more
- Available for all versions of LightWave
- Pro Textures Combo (24 seamless images) included FREE!

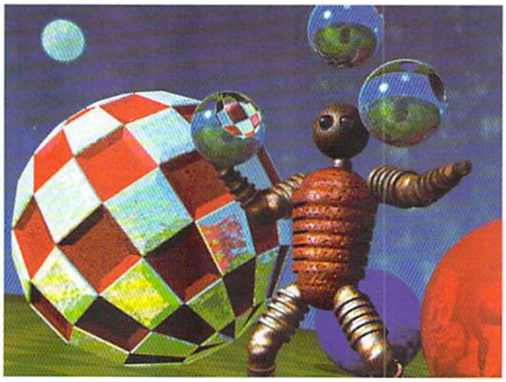
Copyright 1997 Merlin's Software • Visual Inspirations
809 West Hollywood • Tampa, Florida 33604
8139356410 Voice/Fax • 8139356513 BBS
Internet: http://www.vionline.com • Email: visual@vionline.com
Visit our new LightWave/Flyer Online Magazine at:
http://www.vionline.com/newtek/

Also available from LIGHTSPEED - US ORDERS 800-764-8696 - Outside US 805-726-3545

IMAGE GALLERY

The following Images are 1st place winners from the monthly LightWave Mailing List Contest on the internet.

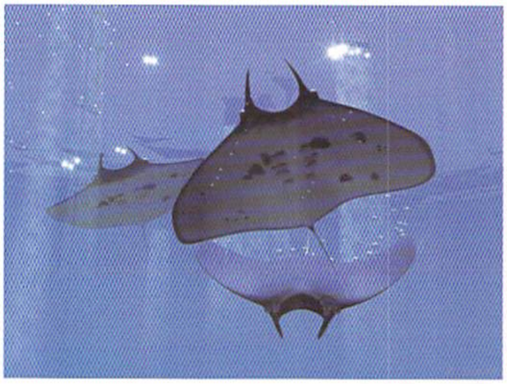
NOVEMBER 1996 WINNER



Name: 3D Classic

Created with Lightwave 5.0, no plug-ins used. All objects were created from scratch. This is homage to a pair of Amiga classics, Boink! and the raytraced Juggler. The Amiga ball is now a globe with protruding and recessed panels of chrome and red marble. The Juggler inspired look-alike uses a slightly different design from the original one by Eric Graham. The original Juggler was entirely made up of colored non-textured mapped balls. In this version the Juggler sports a set of ribbed limbs and torso, all of which are heavily texture mapped. I wanted the textures to make it look like poor old juggler has been outdoors too long, as though he had been continuously juggling balls outdoors since 1987. The scene used no bitmaps for its textures. Everything was procedural textures layered on one another. The only raytracing used were reflections and refraction. -Michael C. Ling (mikeling@nyc.pipeline.com)

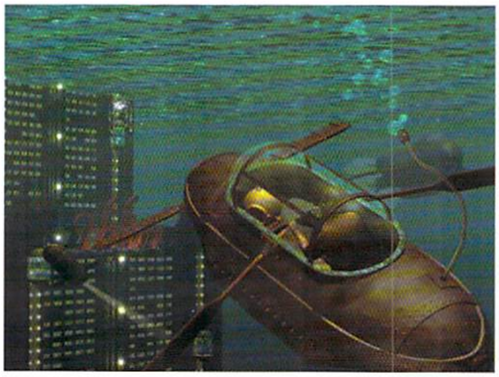
SEPTEMBER 1996 WINNER



Name: Mantas At Play

The mantas in this scene are 3 instances of the same object. This is so I can show the different parts of it without being artificial about it. The horns, mouth, tail, body and the gills are MetaNURBed as one object. I added the eyes afterwards, and some details were refined by metaforming. In layout, the manta is boned and the scene saved. The small bubbles are simply single point polygons. The large bubbles are created using the bubble plug in and deformed slightly to give them some sense of velocity. They are also cloned, then the clone is smooth shifted to a slightly larger size. The Outer Bubble is given a refractive index of 1.33 and the Inner Bubble a refractive index of 1.0. This gives the bubbles their distorting effect. The light beams are the usual extruded sheets of polygons with appropriate transparancy and fractal textures applied. Fog is used to make objects dissapear into the distance. The sparkles are individual lights with lensflares. -Norman Cates norman@sfmc.org.nz

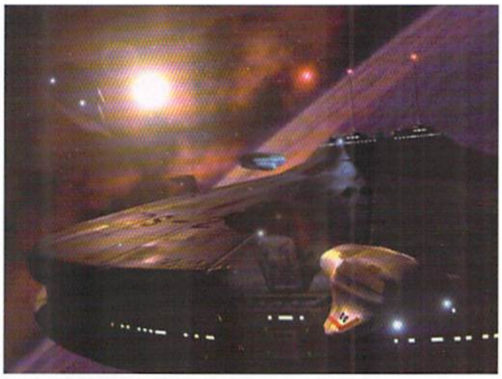
JULY 1996 WINNER



Name: RowSub

A Submersible Rowboat is a rather unlikely (and slow) way of getting around underwater I must admit. The idea is one I've had for a while now and is inspired by early 20th century illustrations of what various aspects of futuristic society would look like. I used LW 5.0 with Picture Publisher for image maps. The Modeling was fairly straight forward, using Metaform, booleans etc. A few bones were used in Layout to position the Rowers arms. The Surface fuzz shader was used for the wake of the big Sub in the background. -Steven Johansen vokman@ozemail.com.au

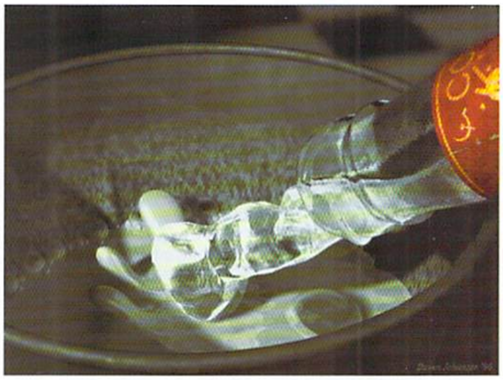
OCTOBER 1996 WINNER



Name: Eminent Danger

The image is of the United federation Defense Station 211 orbiting the planet of Mekken I, along the Dark sea border. The station was created with the most basic of LightWave tools such as lathe, bevel and booleans. The patrol crafts were modeled with metaform in 20 minutes. The scene has one keylight, fill light, and another to bring out the specular highlights of the escort ships. I wanted to create a dark and hostile environment with my use of lighting. Extra flares were added to the station and the radar and antennas are lit separately as well to make sure they can be seen in the shadow. I have a very dark blue ambient at a setting of 20% to bring out a little more contrast between the hot and cold areas. Texture and background wise...all loaded up in LW at 2.3 MB. I used a small bump map to create the grids on the station and used all the texture types at my disposal to give the station and ships some character. Nigel@warehouse.net

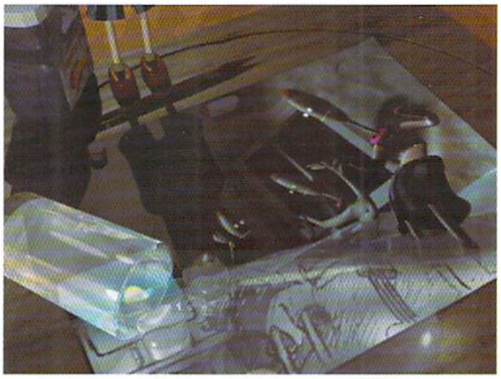
AUGUST 1996 WINNER



Name: Spiking the 'Shake'

I was aiming for simple but effective with this image. It comprises of a couple of lathed objects. The splashes were MetaNURBed. Everything was made with LightWave 5.0 with post process blurring of the background tiles done in Picture Publisher. I wanted a depth of field effect but at a final render time of roughly 28 Hours at Low AA I didn't feel I could afford to move to Med AA, so I faked it. -Steven Johansen vokman@ozemail.com.au

JUNE 1996 WINNER



Name: Cel Flood

This frame was created in 3 parts. First the scene on the cel was set up. The room is a model of the room I am sitting in right now. The wall texture was created in Lightwave and processed in Image FX on an Amiga 2000.The characters were modeled beginning with a subdivided rectangle. I added arms, legs and hands using beveling and the whole thing was Metaformed. Each character has 8 bones which were used to pose them. Once the first scene was set up it was rendered in 3m30s on a Raptor 3. This image was converted to Line-art in ImageFX and printed in B&W. I then traced/sketched it on paper. This sketch was lined up with the original and then digitized. I then drew a matte and composited the render and the drawing so that the rendering would wash away to reveal the sketch underneath. This then became the image on the cel. The final scene consists of the cel on the peg bar, the tipped over water glass with puddle and ice cubes, an ink bottle and paintbrush. Other objects were added (lights, windows etc.) out of camera sight to be reflected in the glass and ice. This was rendered with trace reflection, shadows and refraction all turned on. It took 1 hour and 56 minutes on a Raptor 3. -Nicolai Grut (nicolai@passport.ca)

ON TOPIC

By David Warner

As moderator for the LightWave mailing list (LWML), I see a lot of questions come and go every day. Most of them get answered pretty thoroughly, sometimes with many different responses to a single question. This column is my attempt to share some of the more interesting topics that have been covered on the LWML in recent months.

Before getting into this issue's topics, let's have a little history lesson: The LightWave mailing list was created by Bob Lindabury in 1992 and he ran it until 1994, when Daniel J. McCoy took control for about a year. I've been running the mailing list(s) since August of 1995 and even though it can sometimes be a lot of work, I really like the fact that so many people are benefiting from the exchange of information that takes place regularly on the LWML and other mailing lists that I run.

All of the questions and answers that I present here are compiled from a number of different e-mail messages so it's difficult to quote any one member of the LWML, but I would like to thank everyone who posts useful information on the LWML...this column would not be possible without your participation.

Now let's get into this issue's topics...

Q: When modeling objects with the OpenGL preview window turned on, I can't see the dark parts of my object very clearly. Is it possible to change the background color? If so, how is it done?

A: You can change the preview window's background color by pressing the "Ctrl", "Shift", and "i" keys at the same time, then move the mouse pointer into the OpenGL preview window and click the left mouse button. This is the hardware/software switch for the OpenGL preview windows, but all that really matters is the background color will change from black to dark blue and your object will be a little easier to see.

Q: I just got done installing LightWave v5.0 on my PC and everything works fine except when I go to render an AVI animation. LightWave renders the first frame okay, but then it gives me this error: "The AVIFIL32.DLL file is linked to missing export NTDLL.DLL:memmove." and my AVI animation does not get saved. Why is this happening and what can I do to fix it?

A: LightWave's installer program may have installed an old version of the AVIFIL32.dll library and this is preventing the AVI video clip savers from working correctly. The solution is to re-install the newest version of the AVIFIL32.dll library available. This file can be found on your Windows installation disc or on another PC, in the Windows directory.

Q: What is a good way to model some "hand-written" text with rounded edges, as if it were made out of neon tubes?

A: Select the Ball tool and click on numeric. Make sure that Globe is selected with a reasonable number of sides and segments. Press enter to create the ball. Select a new layer with the ball in the background layer and, using the Sketch tool, draw a curve for the shape of your text. Make sure it's starting point is at the center of the ball in the background layer.

Now go back to the layer containing the ball and put your sketched text in the background layer. If necessary, use the Rotate tool to turn the ball until it's bottom center point is aligned with the curve for your sketched text. Select all the polygons on the bottom half of the globe. Flip all of these polygons and then Rail Extrude them with the curve for your sketched text still in the background layer.

What you have now may look like a big mess, but we're not quite done yet. Select all the polygons in this layer and copy them. Now go to a different layer and click on the Paste button to drop your finished logo into the new layer. Experimenting with different Rail Extrusion options may yield better results, but this will get you started.

Q: I'm noticing a lot of color bands on my shiny objects after they're rendered. What can I do to stop this from happening?

A: Make sure the Glossiness setting for your shiny objects is not set to "maximum". In many situations, this will cause color bands to appear around the object's shiny highlight, so it's safer to just use the "high" Glossiness setting instead.

If you absolutely MUST use a Glossiness setting of "maximum" and you want to get rid of the color banding problem, go to the Effects Panel (Image Processing sub-panel) and change the Dither Intensity setting to 2X or 4X Normal. You may also want to purchase an Image Processing plugin or program that will remove color banding artifacts.

Q: When I try to define a Limited Region, the entire Layout interface gets real slow. What can I do to get around this?

A: Before attempting to define a Limited Region for rendering, go to the Scene Panel and highlight the "Show All Objects as Bounding Boxes" option. This will make the Layout screen much more responsive when defining a Limited Region or when doing pretty much anything in Layout.

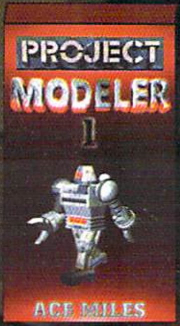
That's all for this issue, but be sure to check this column in the future for regular installments of On Topic messages from the LightWave mailing list.

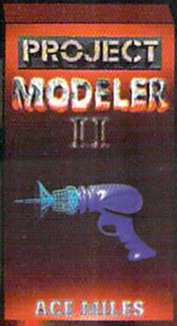
About the Author: In addition to running a couple of different mailing lists, David Warner is the creator of the "TutorVision 3-D CD" series of interactive, multimedia CD-ROM's. You can get in touch with Dave by sending e-mail to dwarner@albany.net or by visiting his web site at http://www.tv3d.com.

PROJECT MODELER

Ace Miles will make it easy for you while he takes you through the steps required to model your own CG 'Movie Set' and props. What could be better for this than building a child's room full of toys?

This first tape will get you started with many of modeler's basic tools as you create objects along with Ace. This includes a toy robot with all the trimmings. All of these techniques and tools will be needed for tape 2.





Only $39.95 ea.

This second tape takes a more in depth look at Modeler! Follow along with tutorials on designing a child's room, his bed and the toys that go under it. You'll also use the extremely powerful metaform and MetaNURBS tools to create a toy phone, cowboy hat, laser gun and more!

Tape One

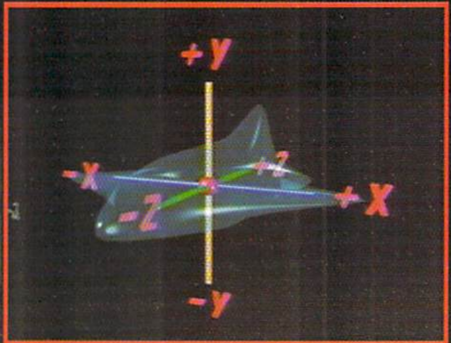
- Working In Layers, Part By Part
- Designing Text For Flying Logos & Other Projects
- Beveling, Extruding, Slicing, Stenciling & Insets
- Stretching, Sizing & Tapering For Detail
- Cutting, Copying & Pasting For Quicker Results
- Display Modes Including Open GL Configurations
- Using Primitives To Create Complex Objects
- Keyboard Shortcuts & More!

Tape Two

- Lathe, Bend & Array
- Single Or Multiple Rail Extrude & Rail Clone
- Complex Polygons With Sketch Tool & Point Manipulation
- Basic Spline Patching
- Metaform & Gaining Control By Slicing & Subdividing
- Exploring Multiple Ways of Modeling The Same Object
- MetaNURBS Made Easy
- Using Other Tools With MetaNURBS To Increase Their Power

ACE MILES

A senior animator at Atari-Games/Williams Entertainment and Lightwave instructor at the Academy of Art College in San Francisco

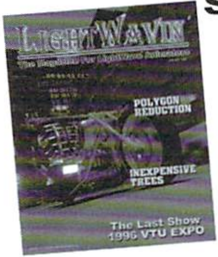


LIGHTSPEED - 2763 West Avenu L Suite 172 - Lancaster - CA - 93536 - USA
US ORDERS 800-764-8696 ALL OTHER ORDERS 805-726-3545 FAX ORDERS 805-726-3544
Visit & Order from our web site at http://www.webcom.com/lghtspd

LIGHTWAVIN'

Pre-Pay your subscription with a credit card or check and ...

HUGE SAVINGS



Save over 40% off the cover price !!!

☐ 1 year (6 issues) $24
☐ 1 year with CD-ROM $48
☐ 2 years (12 issues) $42
☐ 2 years with CD-ROM $84

NAME (PLEASE PRINT) PHONE

COMPANY

ADDRESS

CITY STATE ZIP COUNTRY

☐ PAYMENT ENCLOSED ☐ Circle One: Charge my VISA / MC / AMER. EXPRESS / DISCOVER

Card # Exp. Date Signature

☐ Bill Me (Payment to be made within 30 days) SIGNATURE OF PERSON BEING BILLED :

... receive, 'The Best of the Net" CD-ROM for LightWave users (a $20 value) absolutely FREE!!! Available July 1997.

If you have already paid for your subscription, you will automatically receive the CD in July as well.

SURVEY

How many people besides yourself will read LightWavin' Magazine ? ____________
Which platform are you using LightWave on ? Intel DEC Alpha Amiga Mac SGI
What would you like to see in future issues of LightWavin' ? ____________
What do you like most about LightWavin' Magazine ? ____________
What did you like least about LightWavin' Magazine ? ____________
What is your main use for LightWave 3D ? Games Commercials Forensic Medical Multimedia Movies TV
Other: ____________

For faster service, call 800-764-8696 or 805-726-3546

Canada Subscribers: Add an additional $12 per year. International Subscribers: Add an additional $30 per year.

Please allow 8 to 12 weeks for delivery of first issue.

PLACE
STAMP
HERE

LIGHTWAVIN MAGAZINE
2763 WEST AVENUE L SUITE 172
LANCASTER CA 93536
USA

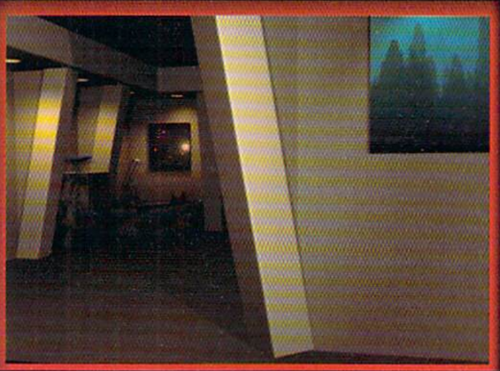
PHOTOREAL FX

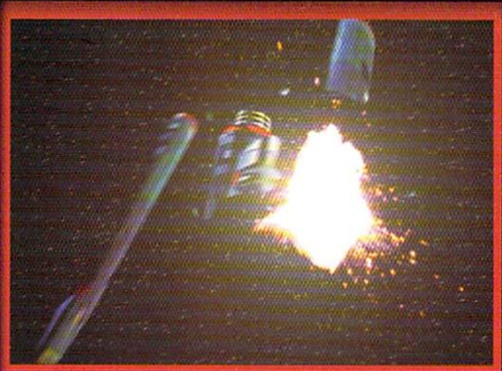
Alan Chan, author of the FX Kit for Lightwave and Power FX 5.0 books now brings you a third and powerful new book, PHOTOREAL FX. If achieving Photo-Realism in Lightwave is your goal, PHOTOREAL FX will show you the ins and outs of making your images look as realistic as possible. With almost 300 pages of tips, tricks & techniques, PHOTOREAL FX will get you up to speed on producing stunning frames in the shortest amount of time.

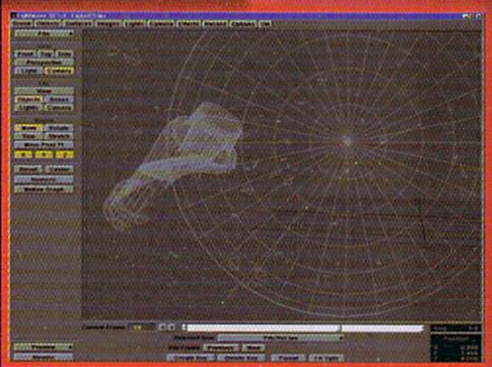
TOPICS THAT ARE COVERED

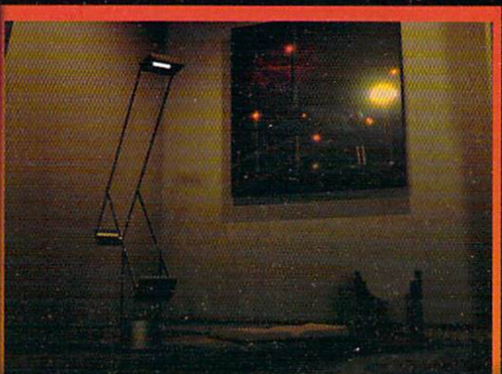
The Real World - Elements Of Photorealism - Art Design Telling The Story With The Camera - How We See Things Using The Real World As A Reference - Power Modeling Techniques - Criteria For A Good Object - Detailing Surface Textures - Creating Complimentary Image Maps Real Vs. CG - Real World Lighting - Three Point Lighting Things Any Animator Should Know - Creating Explosions Shadow Options - The Camera Eye - Creating Smoke Trails & More!

$44.95

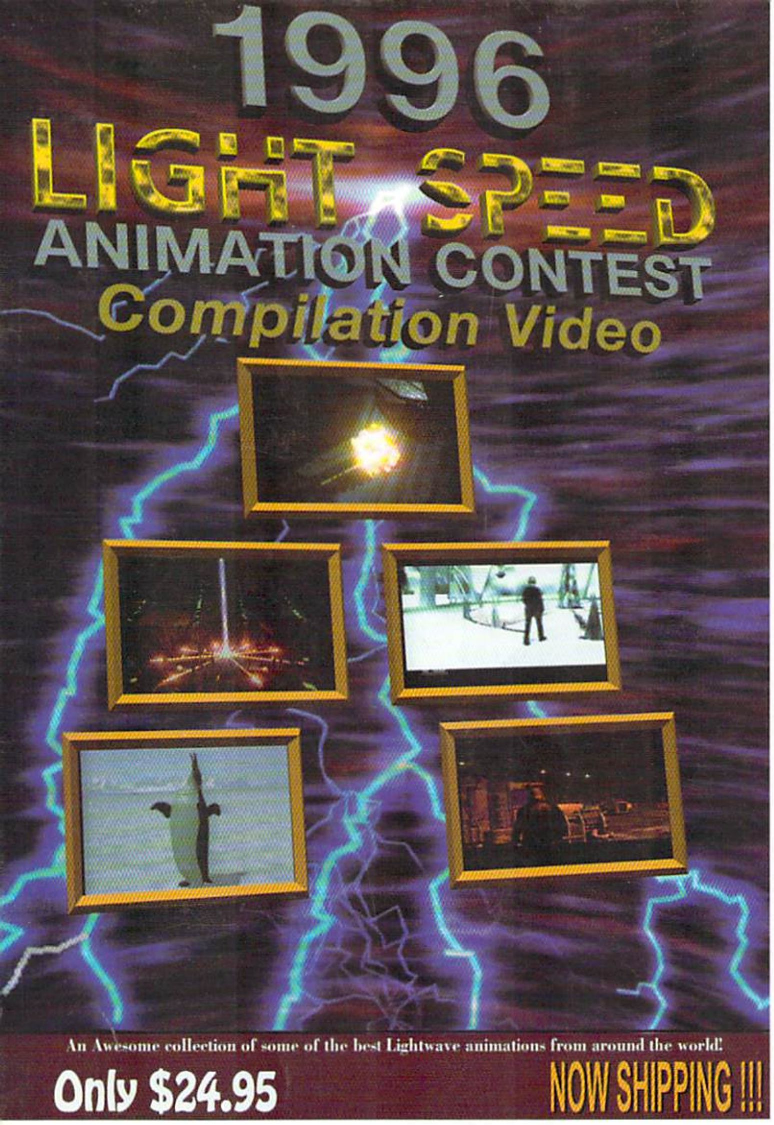








AVAILABLE FROM LIGHTSPEED



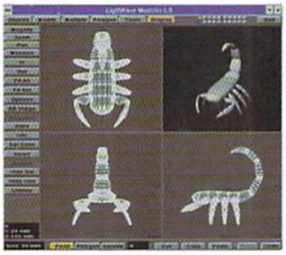
1996 LIGHT SPEED ANIMATION CONTEST Compilation Video

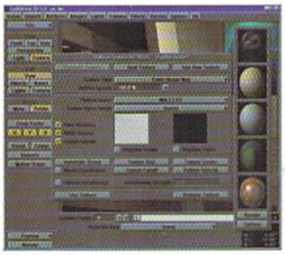
An Awesome collection of some of the best Lightwave animations from around the world!

Only $24.95

NOW SHIPPING !!!

POWER FX
ADDENDUM 5.0





Upgrade your Lightwave library to the Power FX book and you'll have the most complete tutorial guide to Lightwave 5.0 on the market today!

Open G/L, Multiple Texture Surfacing, MetaNurb Modeling, Improved Bones & IK, New Powerful Plug-Ins, Meta-Balls, Metaform-Plus & a host of other new features!

With over 200 illustrations spread over 175 pages, Power FX will cut the learning curve on all the new powerful features found in LW 5.0 down to nothing.

Use Metanurbs to build a scorpion, Metamation to do character animations and use the Multiple texture layers to create effects such as outstanding laser blasts. These and many other tutorials await you in the new Power FX book.

Only $24.95

The FX Kit for Lightwave

FX KIT FOR LIGHTWAVE

Join the thousands of people already enjoying the world's most popular LightWave book, The FX KIT FOR LIGHTWAVE. With over 300 pages and 700 illustrations, the FX KIT will take you on a journey through 11 chapters which include: A Primer to 3D - Getting Around LightWave - Introduction To Modeler - Intermediate Modeling -Surface Concepts - Imitating Nature - space Effects - Waves Of Lights - Bones - IK & More!

ONLY $34.95

LIGHTSPEED - 2763 West Avenu L Suite 172 - Lancaster - CA - 93536 - USA
US ORDERS 800-764-8696 ALL OTHER ORDERS 805-726-3545 FAX ORDERS 805-726-3544
Visit & Order from our web site at http://www.webcom.com/lightspd